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ABSTRACT

This report presents the results of a survey of provisions for adult education in computing in New Zealand between 1984 and 1987. The study focused on the current generation's perception of their need for education about computers, the kind of information they want, whether courses are available to meet their needs, whether the relative cheapness of microcomputers has produced an interested "informed" community, any plans and likely demands for computers in education in the future, and how these demands might be met. The first of seven chapters provides an outline of the content of various kinds of computer courses being taught and summarizes the kinds of material chosen by tutors as they consider what they should teach their adult students. The second chapter seeks to identify the range and nature of computer courses being offered to adults in the general community and to discuss significant concerns and issues arising from the courses. The educational role of computer user groups and their contribution to the rise in computer literacy in New Zealand are examined in chapter three, and chapter four presents an overview of farming applications of microcomputers. Topics for computers in education are suggested in chapter five; the tutors' evaluations of computer education courses are presented in chapter six; and chapter seven offers an evaluation of and some conclusions about the use of computers in education and the development of community programs for continuing education. A glossary of terms, samples of course curricula and prospectuses, and survey data are appended. (23 references) (DB)

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ADULT EDUCATION IN COMPUTING 1984–1987

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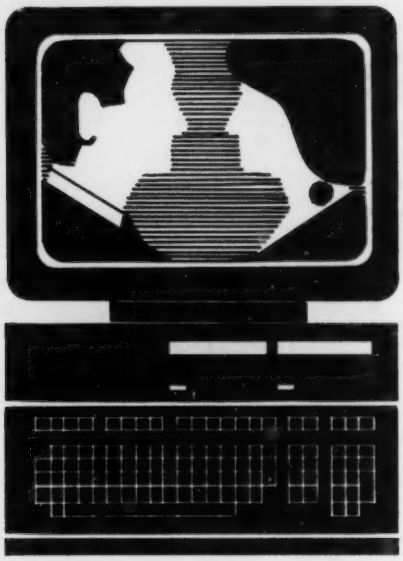

A New Zealand Success Story in Community Involvement

Barbara D. Bibby

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New Zealand Council for Educational Research

ADULT EDUCATION IN COMPUTING

1984 – 1987

A New Zealand Success story in
Community Involvement

Barbara D. Bibby

New Zealand Council for Educational
Research
Wellington
1989

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PREFACE

We present here the results of a study of the provisions for adult education in computing in New Zealand between the years 1984 and 1987, with some up-dates to 1989 in the light of the current changes being implemented through the recommendations contained in Tomorrow's Schools (1988) and Learning for Life (1989). (These two reports set out new policy positions of the Government on educational administration in the primary, secondary and post-compulsory sectors of the New Zealand education system, and are likely to have far-reaching effects on education at all levels.)

The initial idea for this study was my feeling, as a computing teacher and tutor, that it would be valuable to study some of the social changes caused by the increasing availability of the relatively cheap microcomputer. This was in mid-1984. I applied for a J.R. McKenzie Fellowship, administered by the New Zealand Council for Educational Research (NZCER). Following some discussion, it was agreed that I be awarded a 6-months scholarship to enable me to concentrate on just one aspect of the issue, namely, the needs and provisions for adult education in computing in New Zealand.

It soon became clear that this was a very active field and that there was a tremendous demand in the New Zealand population as a whole for information 'about' computers and for help in deciding whether to buy one, what to use it for, how to handle the threat implicit in the introduction of computers into the workplace, and so on. The demand was nationwide, as became clear from interviewing people and from two surveys at the end of 1984. Some trends identified were the decreasing demand for 'programming' courses vis-a-vis 'applications' courses, the surprising number of amateur enthusiasts involved in Computer User Groups and the demand from farmers.

It was also clear that parents as such had played an unusual role in that they had been very active in pressing for computer education in the schools. This meant raising money by school galas, raffles, 'computerthons' and so on. It also meant that teachers had to find time to design curricula and study the best uses of computers in education. In about one-third of the schools it seems that the 'push' for computer education came from parents, although in other cases keen teachers or groups of teachers had to persuade their communities.

In any geographical region, the advent of the microcomputer can be plotted on a typical S-shaped innovation curve, whose slope is indicated by the number of people attending computer courses. An initial slow up-take while enthusiasts come to grips with the new technology is normally followed by a rapid rise in popularity as the innovation takes hold; then comes a tapering-off period as the innovation spreads, becoming generally accepted and commonplace. In late 1984, some communities were much further 'along the S-curve' than others. For instance, computer education was well established in many community centres in the Auckland region but a great deal of activity and growth was occurring in the Hamilton area.

During the next two years the results of the research project were analysed with assistance from NZCER staff, and the study was concluded by two follow-up questionnaires at the end of 1987. This means that we have a detailed survey of the attitudes of adults to computing, covering an extremely interesting three-year period (1984-87). We also have numerical estimates of the people interested in learning about computers from about 1981, when microcomputers were a rarity, to 1987, when virtually every secondary school had a class set of microcomputers and many primary schools were also becoming involved in computer education. Today, in 1989, one need only glance at the 'situations vacant' columns in the newspaper to see how commonplace computers have become in New Zealand society.

To make the study manageable, we deliberately excluded from consideration any 'professional' computer science courses, any full-time study in data processing, etc., concentrating on the 'non-formal' sector only. We found that, on a conservative estimate, about 25,000 New Zealanders had attended computer courses of the 'general interest' kind over the period between 1981 and 1987. This approximates 1 percent of the total population. Similarly, conservative figures from the Computer User Groups indicate that about 1 in 300 New Zealanders have been involved in such groups over this period; we suggest in this report that such groups can have a significant educational role.

The 1987 surveys showed that some regions (Tokoroa, for example) were still coming up to the 'steep part' of the S-shaped innovation curve, whilst in other 'more established' regions, tutors reported that there was continuing interest, but less in introductory courses, more on advanced topics.

This study, therefore, provides information concerning the response of New Zealand society to the relatively sudden advent of the microcomputer. It is not a complete picture: it has no information, for instance, about those

who are too shy, too poor, too infirm or who live too far away to attend adult classes even though they may want to do so. What it does show is groups of parents and teachers assertively providing the means for the new generation to be able to cope with computers. Meanwhile the parents themselves are using their own initiative to get the new skills needed in the computerized workplace, if such training is not provided or suggested by the employers. Effort is also being made to realize the potential of computers in remedial and work-skills programmes.

The New Zealand population as a whole, which has long been regarded as having a high degree of literacy, would seem to be on the way to achieving a high degree of computer literacy also.

I should like to thank everyone who has helped me with this research. Thank you to the tutors I have spoken to and worked with, and to those who have answered my questionnaires and discussed them further with me. Thank you to the Computer User Groups which have made me welcome at their meetings and answered my questions. Thank you to so many people, experts in hardware, software and courseware, for giving me your time as well as information. And thank you to all the adult students I have taught, for being so interested and pleasant to work with.

Thank you also to the NZCER for making it possible for me to do the research and providing facilities; to Sashi Meanger for help with the first questionnaires, to Lynne Smith for her editorial assistance, and to Ian Livingstone, the NZCER Director, for his constructive criticism and support throughout.

Barbara Bibby
March 1989

INTRODUCTION: COMPUTER EDUCATION AND THE RESEARCHER:
Research Procedure and Methodology

When this study of computer education was begun, in 1984, today's adults were seen as a transition generation, being forced to adapt very rapidly to a new form of technology. Thus the study was shaped around the following questions:

(a) Does the present generation of adults feel a need for education 'about' computers?

(b) If so, what kind of information do they want?

(c) Are courses available to supply these information needs?

(d) Has the relative cheapness of microcomputers produced an interested and enthusiastic 'informed' community?

(e) What plans are 'on the drawing board' regarding computers in education?

(f) What are likely future demands for education in computing?

(g) How might these demands be met?

This report deals primarily with 'evening classes'. Some of these are offered by community education divisions of secondary schools, some are run in community education programmes of many kinds, and some are organized by rural communities. The organizers of such classes are guided by community request, demand or need in designing what is offered, and this can give a unique atmosphere: people are there because they want to learn. Many tutors have commented on this 'warm atmosphere', 'relaxed and entertaining'.

The report also includes courses which fall under the general heading of 'in-service training' offered, again in response to request, by Continuing Education units at Universities, Teachers Colleges and Polytechnics.

As will be seen in Chapter 6, we have also included material on the courses described in New Zealand as 'transition education', a term which includes work-skills programmes, the previous STEPS and YPTP programmes and the current ACCESS programme.

The report does not deal with career-oriented, professional courses in computing or data-processing: this has been studied by the Vocational Training Council.[1] Nor does it deal with the use of computers to help the disabled,

which is addressed elsewhere.[2] A relevant study of computers in the Polytechnics has been carried out by the Department of Education.[3]

The study began with consultation with officers in the Department of Education, from both the Computer Courseware Development Unit (later renamed the Computers in Education Development Unit - CEDU) and the Continuing Education division, to find out what classes were being offered to interested adults throughout the country. This was followed by visits to tutors at schools in the Wellington area, at the Wellington High School Community Institute, Wellington Teachers College and the Centre for Continuing Education at Victoria University of Wellington. Discussions were held with staff from the National Council of Adult Education about provisions in New Zealand for Lifelong Education. Computer User Groups were contacted in order to see if they were interested in computer education. During this period I also continued to teach adult classes in computing for the Workers Education Association and for a variety of parent groups, and made a point of attending computer fairs and exhibitions. Information gained from these sources, plus the results of a literature search, provide the basis for Chapter 1.

Conversation with local tutors suggested that there was a large demand for computing courses, which was likely to continue as people attempted to keep up-to-date with the rapid changes in computer technology. There seemed to be a trend away from 'programming' courses, towards 'applications' courses. (Such terms are defined in Appendix 1.) Some tutors who did teach programming courses had moved to teaching the language LOGO rather than BASIC. Courses offered could be divided into professional, vocational and general categories. This information provided the basis for a brief questionnaire forwarded to educational institutions and centres of adult education around the country at the end of 1984. The response was overwhelming, and the results are discussed in Chapter 2.

Visits to Computer User Groups in Wellington and Auckland revealed a surprising diversity of purposes and activities. Some were hobbyist programmers, some were business-oriented, some had begun by making their own computers. All were groups of enthusiasts. User Groups seemed to be the focus of a developing computer awareness throughout the country, organising exhibitions, building computer-to-computer communications networks, and defining ethical standards in computing. A second questionnaire was therefore designed at the end of 1984, to be directed to Computer User Groups (See Chapter 3).

Visits to Christchurch Polytechnic and Christchurch Teachers' College

followed, as well as a visit to the Kellogg Farm Management Unit at Lincoln College and the 'information co-operative' at Ellesmere College, Leeston. An intensive few days in Auckland included visits to Edgewater College (Pakuranga), and Glenfield College (Northcote), both vigorous centres of adult education in many subjects, including computing. Computer classes at Carrington and Auckland Technical Institutes were also visited, and discussions held with tutors who were engaged in planning a wide diversity of courses, depending on local demand.

In replying to the first questionnaire, many tutors commented on the interest in computers shown by farmers and the lack of adequate software for the teaching of farming applications. The topic was so interesting that it was studied in more detail and forms the basis for Chapter 4.

Some ideas about the courses available for teachers and the potential role of computers in education are given in Chapter 5, while Chapter 6 contains replies from tutors involved in using computers in 'transition' education such as work-skills programmes.

Chapter 7 sums up the results, particularly in the light of two 'follow-up' questionnaires which were sent out at the end of 1987. Those tutors who had indicated that they did teach adult classes in computing in 1984 were sent a summary of initial findings, and were asked for comments on changes which had occurred since 1984. The response rate was not as high as had occurred three years previously, perhaps because it was near the end of the year, perhaps because teachers had changed schools. Nevertheless over 100 replies were received out of a possible 200 and the responses showed that much enthusiasm was still being maintained. A similar follow-up was sent to Computer User Groups which had replied to the earlier (1984) User Group questionnaire; here again the response rate was only about 50 percent, but the large number of questionnaires coming back post-marked 'return to sender' suggests that such groups of enthusiasts are very transient.

Appendix 1 contains a brief list of commonly used computer terms for reference. Appendix 2 contains a selection from the many and beautifully presented prospectuses and other material which have been very kindly sent to us. Appendix 3 is a bibliography with details of books, reports and journals mentioned in the text, as well as suggestions for further reading. Appendix 4 contains estimated numbers of adult students and of members of Computer User Groups as supplied in the follow-up questionnaires covering the period 1981-87.

FOOTNOTES:

1. Jackson, Ivan C. (1983)

2. Cranshaw, Adrianne. (1986)

3. Mills, Nancy Watson. (1988a)

1

COMPUTER EDUCATION AND THE TUTOR:
What Shall I Teach?

In this chapter we present an outline of the content of various kinds of computing course, summarising the kinds of material chosen by tutors as they considered what they should teach their adult students.

Introductory Courses

The kind of course in most demand initially, both at schools and in adult classes, was an 'introduction to computers', also called 'computer awareness' or 'computer literacy'. In the schools this kind of course was brought in at third or fourth form level in the early 1980s, either as a separate course or as part of a Social Studies unit. Resources for schools, available from the Department of Education, were adapted by some teachers for their adult courses. No official curricula for adult classes were issued by the Department, although the Department did pay the tutors. Many of them commented that they had to work out for themselves what to teach.

In replying to our questionnaire (discussed in detail in Chapter 2), many tutors recommended that adult classes in computing be relatively short, say 5 weekly lessons of one-and-a-half to two hours each; not more than 10 weeks per course. If the students wanted to carry on with computing, then modules in other or more advanced topics should be provided, also relatively short. The old rule that evening classes had to be for 26 weeks resulted in high drop-out rates. Appendix 2, which contains some of the very many prospectuses kindly sent to us, includes the successful modular scheme designed by Wellington High School Community College.

Most tutors liked to have two people per computer on an introductory course. This seemed to give adequate 'hands-on' experience (i.e. the essential activity of actually using the keyboard) while still allowing co-operation and discussion which helped overcome any fear or feeling of threat due to unfamiliarity with the machine.

Whilst all tutors had developed their own preferred approaches in such courses, some which impressed me were:[1]

At an introductory course for librarians, in Levin:
Some 'hands-on' experience was given first, followed by discussion and demonstration of a 'database', namely the school's records on computer; the recounting of the history of computers was enlivened with the tutor's collection of ferrite cores, chips etc.

At a course on 'computers for women' run by a journalist and a BBC Users Group enthusiast:
Techniques common in 'women's courses' were used to break the ice and the supportive atmosphere was enhanced by provision of morning teas and lunches; a networked set of school computers gave plenty of hands-on experience.

At one of 12 sessions in an in-service training course for teachers at Wellington Teachers College:
For this 4-hour session on a Tuesday evening teachers had come from as far away as Levin. Participants were asked to develop an algorithm for a sorting program in very concrete terms, using sets of scales and weights.

At Pongoroa, where we ran a joint computers-in-education computers-in-farming course:
My co-tutor arrived with a car-full of computers and demonstrated how to sort ear-tag numbers at the push of a button, acording to wool-bale weight. The computer was seen to have its uses in farming, although 'it still can't go round and check the fences'.

The first time I saw the language LOGO being taught as part of a Teachers College introduction to this language:
Here, a robot 'turtle' was moved about on the floor in response to computer instructions coded in by 5-year-olds. The children hardly knew left from right: many had R and L inked on their hands to help them. Yet they were using these ideas, and learning about angles when they needed to, in order to use this fascinating system.

A Useful Framework: Tutee/Tutor/Tool/Toy

While still on the subject of introductory courses, it may be helpful to outline here a framework which I used in many computer classes around 1984. This framework was also adopted by the YMCA's travelling computer school which toured the country in the summer of 1984-5 and taught some 1,400 people. Five years later the approach seems over-simplified, but it was useful at the time.

The framework was based on the concept provided by Robert Taylor in the title and introduction to his book 'The Computer in the School: Tutor, Tool, Tutee'. He explains how to evaluate educational software according to the role of the computer. For example, at two extremes: if the machine has been programmed to present material on the screen and require the user to answer questions on this material, then the machine is the TUTOR; however, if the user is telling the machine what to do, i.e. programming it, then the machine is the TUTEE. I expanded this idea to use the framework of TUTEE/TUTOR/TOOL/TOY.

A typical four-topic sequence would run as follows:

TOPIC 1: TUTEE

The computer was presented as a brilliant brain, with a tremendous IQ but no knowledge as yet, waiting to be taught what to do, like an actor waiting to be told his role. The brain receives INPUT not through eyes and ears but through keyboard, disk, tape; the brain OUTPUTS not through a mouth but through the screen and printer. What roles can the computer have?

We began by giving the computer the role of TUTEE, i.e. started some programming. A program is a list of instructions for the computer, written in a language or code; in fact the acronym BASIC stands for Beginners All-purpose Symbolic Instruction Code. In BASIC each statement is numbered, often in 10's to allow insertion of afterthoughts; we slash the zero to distinguish it from the letter O and to look properly computerized, after only 10 minutes of instruction! A worksheet was given out, a one-page program with PRINT and GOTO statements; the students typed it in, played with it, explored punctuation, LIST, RUN and SAVE, printed out their work on paper. In such sessions the atmosphere was always pleasant; it was so nice to teach interested, motivated people. Some were hesitant, though, and I often wished I could be helping everyone individually at once. My wish was granted during two courses for parents when several school pupils volunteered to help me teach.

TOPIC 2: TUTOR

Last week we explored the computer as TUTEE: we programmed it; we told it what to do. We now explored the computer as TUTOR. I began by stressing the need to be critical of so-called educational software - some of it is poor. I liked to find some excellent drill-type software like a touch-type tutor and to contrast this with the kind of program which simply presents material on the screen (Why not just read a book?) and says 'push NEXT when you have read this'.

The software available for discussion obviously determined the exact content of this lesson.

TOPIC 3: TOOL

We explored the computer as a TOOL. Options available here are wordprocessing, database management, spreadsheets and lately Computer Aided Design (CAD). Again the lesson depended on the software available but I tended to concentrate on the wordprocessor so that the students were writing letters and printing them out by the end of the lesson. Some classes were particularly interested in databases ('How do you really get all your recipes on the computer?') and enjoyed a discussion of binary code, how the machine stores information and how it finds a given item.

TOPIC 4: TOY

Now the computer is a TOY. Did the class then spend an hour playing arcade-type games? No, but we would spend some time discussing them, since as realistic parents we know that the children will want to play games if we do get a computer. So protect your keyboard by getting a joystick!

The way in which games are programmed is fascinating. With the software then available, I would introduce the class to a few simple tricks, such as the use of RANDOM numbers and INPUT statements. (Useful programs of this kind are given in the series of Usborne books, such as 'Computer Space Games' by D. Isaaman and J. Tyler.) Nowadays CAD is so advanced that it would be much easier to discuss sophisticated graphics.

I usually found that there was still time after this for the question which the students really wanted to ask, namely, 'Which computer do I buy?' This question was easier to answer once we had looked at the various roles of the computer. The answer is: 'Think carefully what you want your computer to do.' For a more detailed assessment and guidance there are now many consumer-type books and articles such as 'Choosing your first computer system'

by K. Ian Mitchell and Bevan Clarke, and the June 1985 issue of Consumer magazine.

Programming Courses

When microcomputers first became available most tutors were mathematics or science teachers who had done some computing on the 'old' mainframe computers or terminals at university or college, using FORTRAN or COBOL. As a result, most tutors assumed that a 'computing course' was of necessity a course in programming. Most early courses for adults offered 26 weeks of evening classes (2 hours per week) whose numbers sadly dropped during the year as participants found that 'it is hard to program'. Even today, tutors find that, 'people register for a 10-week introductory course and then expect to be able to go out to get a job programming'. Most tutors today suggest an initial introductory module to be followed by further programming courses, either at night school or at a Polytechnic, if the student has interest, aptitude and perseverance. The book 'Programming made Simple' by Andrew Wood was developed at Edgewater College, Pakuranga, and has been extensively used in the Continuing Education program there.

Programming does not have to be in BASIC. Many tutors preferred to use LOGO instead. This language was developed by Seymour Papert and is described in his book 'Mindstorms: Children, Computers and Powerful Ideas'. In LOGO the computer is clearly the TUTEE, whose job is to obey coded instructions and hence draw figures on the computer screen. The language is meant to be introduced with a (costly) robot turtle such as I saw overseas; most New Zealand teachers have to omit this aid to concrete thinking and have to imagine that the triangle on the screen is a 'turtle'. The language LOGO differs from BASIC in that the users create their own language as they go along, building (choreographing?) complicated subroutines from the initial simple procedures. This insight into procedural thinking is extended in the higher levels of LOGO programming and many tutors find it preferable as an introduction to programming.[2] Recently tutors at the CEDU have investigated combinations of the LOGO language with do-it-yourself robots available from the childrens' toy manufacturers LEGO.

Applications Courses

It was not initially obvious that there would be a need for 'applications'

courses, namely, for courses teaching you what to do with a bought package where someone else has already written the program, presumably debugged it and all you have to do is use it. Ideally one should be able to buy a complete program to do wordprocessing, database management, spreadsheets or stock reconcilations at will. The accompanying manual and instructions should be self-sufficient, so that one could simply USE the computer as the TOOL one chose.

In reality it is impossible for novices to buy a computer and just start using it. They need help in deciding what area is of interest to them, help in choosing hardware and evaluating software, and help in knowing in general what this kind of program will do, so that they can interpret the instruction manual. For instance, someone who has bought a computer system primarily for the benefits of its desk-top publishing capability (which is satisfactory) cannot spare, 'the six months it would take me to unravel the gobbledegook of the instruction manual that came with the program for computer-aided-design (CAD)'.

It is this need for applications courses which has caused the remarkably high enrolments in adult education in computers. The kind of applications courses which can be offered by a given institution depends on the hardware and software available. The application in most demand is the wordprocessor, probably because its use is clear-cut. People like the idea of using it for home correspondence, or else hope that some courses in wordprocessing will enable them to look to employment in this field. Aware of this, many tutors now report that, 'people want a certificate of some kind at the end of the course. Pitmans is a useful standard to aim for'.

Database management and spreadsheets are also commonly asked for, either by people who want to use them in small businesses or for home budgeting, cataloguing etc. The institution may also have resources for specialized applications such as CAD (computer aided design). An interesting demand for farming packages is discussed in Chapter 4.

Computers and Ethics

Even a few introductory lessons in programming make it clear that other people can 'get at' your program by CATALOGUING what's on the disk, then by LOADING your program on to their computer, making changes, and SAVING it with the original name, thereby wiping out the original program. This can lead to a discussion of 'hackers' (in the modern derogatory sense of the word) who

misuse information, interfere with the security of records in the Wanganui Computer Centre, and so on. It is important to realize that the computer is quite passive throughout; it doesn't 'know' the meaning of any of the information it is fed; it merely stores information, processes it and regurgitates what it is told to. Like any other tool it can be misused.

The operation of passwords and locks is useful to discuss, as are copyright problems. 'Pirating' software is now very common; but companies which charge what appear to be exorbitant prices for software are recouping the costs of development and legally entitled to do so.

Questions about computer ethics were included in the initial questionnaire to the Computer User Groups, and as seen in Chapter 3 there were few surprises in their replies. Nevertheless, I still feel that computer ethics is an important issue for discussion, and would argue that it is better to train a generation which is responsible in the use of information than to develop 'computer whizz-kids' brilliant at 'hacking'. A recent deterrent to 'carte-blanche' copying of software has been the proliferation of computer 'viruses' which can distort programs or make them unusable, on a large scale. 'Hacking' of this magnitude is now regarded not only as unethical, but thoroughly anti-social and illegal.

In-Service Training Courses

As with any innovation, the introduction of the computer has been seen as a threat in many professions. Accordingly, Polytechnics and the Continuing Education Units at Universities respond to needs expressed by various groups, and organize in-service training seminars in the use of computers in fields such as architecture, pharmacy, librarianship, and engineering. The clearer the expressed need for a given course, the more likely it is to be useful and relevant.

Teachers as a group often express the need for in-service training in the use of computers in education. Some ideas on this subject are contained in Chapter 5.

Computer User Groups

The Computer User Groups seem to have grown from the natural need of people to discuss and share their interests and problems, whether in using computers or in teaching with them. Some factors influencing the remarkable growth of such

groups were the lack of interest of dealers once a sale has been made, the frustration caused by being unable to understand something about the computer or to debug a program, and the desire to get club-rates in buying hardware as well as cheap rates in obtaining software. By the end of 1984 there were over 100 such groups in New Zealand, some of which were specifically educational and have now joined to form the New Zealand Computers in Education Society. Computer User Groups form a resource which is available to help computer tutors, although some tutors have told us that, 'there are no such groups in our area and the only kind of group which is of use to us is that which produces a regular newsletter.' With the advent of the modem (a unit linking computer to computer by telephone) it may not be necessary for tutors in remote areas to be isolated in the future. Computer User Groups are discussed in detail in Chapter 3.

Computer Fairs, Exhibitions and Conferences

Most computer exhibitions are organized by salespeople wanting to sell hardware and software, and can be disappointing to an educationalist; at one display at the Overseas Terminal in Wellington it was necessary to make one's way through hordes of computer games displays in order to find any educational information. Some exhibitions are aimed at particular markets, such as businessmen. Some exhibitions are run by Computer User Groups, as has been reported to me by several groups in Auckland. The most interesting exhibition I attended was at the end of 1984 at the Michael Fowler Centre in Wellington, entitled Computers in Education. The state-of-the-art displays of hardware and software were open to the public, including many school children, and there was also a day-long programme of seminars.

The New Zealand Computers in Education Society held its first conference in Auckland in August 1985, with an immense amount of stimulating material and excellent overseas speakers. The major problem was that, with so many parallel sessions and workshops, not all of the topics could be covered. A second successful conference was held in 1987.

FOOTNOTES:

1. I should like to thank those tutors who have allowed me to 'observe' their courses so that I could report on them here.

2. Studies on the use of LOGO still centre on the work of Papert at MIT, my favourite being Sherry Turkle's book The Second Self which investigates how children respond to computer learning. Ken Ryba and Pat Nolan at Massey University have produced a study 'Assessing Learning with LOGO' and studies on the use of LOGO in schools are among those being carried out under the joint auspices of the NZCER and the Department of Education.

COMPUTER EDUCATION IN THE GENERAL COMMUNITY: A National Survey of Courses

One of the objectives of this project was to ascertain the range and nature of computer courses being offered to adults in the general community and to identify significant concerns and issues arising from and relating to the courses.

Survey Sample

After consultation with tutors of computer courses for adults in the Wellington region, a questionnaire was constructed and sent to the following institutions at the end of 1984:

a) 392 secondary schools
b) 7 Teachers Colleges (abbreviated TC below)
c) 21 Technical Institutes and Community Colleges (abbreviated TI/CC)
d) The 7 Centres for Continuing Education attached to the Universities
e) The 42 REAP Co-ordinators - from a list supplied by the National Council for Adult Education. (The acronym stands for Rural Education Activities Programme.)

The questionnaires sent to the secondary schools and the Teachers' Colleges were addressed to the Principals. Four copies of the questionnaire were sent to those institutions where it was considered likely that different departments within the institution might offer separate programmes.

Response to the Questionnaire

In total 469 centres of adult education were surveyed. Replies were received from 393 centres, giving a response rate of 84 percent. On average, the universities, Technical Institutes and Community Colleges returned two

questionnaires each, giving a total of 417 respondents.

The replies were grouped into three categories:

1) YES - those offering computer courses to the general community
2) NO - those not offering computer courses
3) MAYBE - those considering offering courses.

The numbers and percentage return from each type of institution are shown in Table 1.

Table 1 Computing courses offered by institutions of adult learning in New Zealand: 1984

Institution	RESPONSE Yes %	Maybe %	No %	Total Number	Percentage Return
Schools	47	12	41	340	87
TIs/CCs	94	3	3	35	86
REAPs	48	20	32	25	60
Universities	90	0	10	10	71
TCs	85	0	15	7	71
All	53	11	36	417	84

Two factors indicated a high level of interest in the survey. First, 75% of the responses were returned to NZCER within three weeks. Secondly, many respondents had written detailed statements in the section of the questionnaire set aside for comments. A six page 'interim assessment' based on these data was prepared and returned to the tutors before the long summer vacation, as a way of thanking them for supplying this information. The following chapter reflects the same themes as did that interim assessment, but includes comments selected from all replies finally received.

Reasons for Not Offering Computer Courses

One hundred and fifty (36%) of the institutions stated that they did not offer computer courses to the general community, the main reason being the lack of

necessary hardware to provide courses.

Forty-five (11%) of the institutions surveyed stated that they were considering offering computer courses for adults. Comments from these institutions in the 'maybe' category indicated that many were in the transitional phase of developing courses, but still lacked either the necessary equipment or the trained staff to teach courses - in some cases both.

Other respondents in the 'maybe' category felt that there was a need to first increase computer awareness in their local communities. One explained that, 'adult awareness is an important objective to us', and another stated that, 'the institution gives individual tuition in computer education as a community service, since there are insufficient numbers for a class.'

Institutions Offering Courses

Forty-three of the 221 institutions completed the questions without additional comments. The remaining 178 replies drew attention to issues which have been organized under the following headings:

The demand for computer courses for adults

It was clear that there was a strong demand for computer courses among the general population in both urban and rural areas. For example, in one region a market survey two years previously had indicated that 30 percent of the population wanted to know about computers. A similar demand in another area was illustrated by the following response: 'We advertised - once - a twelve place computer awareness course for three weeks, for two hours a week. We filled five courses immediately and are rolling them through - even in our small, evening-class-shy community there is a great demand for knowledge which we are trying to satiate in the first "wave" of low-level hands-on information courses.'

One innovative school had taken advantage of the demand for classes thus: 'We embarked on adult computing (courses) purely to pay back the $27,000 loan we had to take out ... to pay for thirteen computers needed ... in the school. This exercise has involved hundreds of out-of-school hours of planning and work. The school has paid off all loans and now owns $34,000 in computer hardware.'

One writer commented, 'There is a need and desire in the community ... to know what computers can do [and we need] to dispel the myths and mystery

surrounding computers.' Another, noting that computer education was in a transitional phase, nevertheless questioned the ad hoc nature of computer education for adults and implied that such provision should be systematically planned.

The kinds of computer courses being offered

Two points should be made before examining the data relating to the kinds of courses being offered by different institutions. First, career courses for those in the electronic data processing field have been extensively documented elsewhere.[1] This report therefore excludes such courses, which are usually taught in the universities and technical institutes.

Second, many secondary schools pointed out that some adult students attend sixth form classes in computer studies rather than courses designed for adults only. One school using this approach had found that the 'mixture of adults and adolescents is beneficial to both.' However, many adults cannot attend classes held during week days, preferring shorter intensive courses held at other times.

In the questionnaire, respondents were asked to select the type of course offered by their institution from the following five categories:

1) General information classes, e.g. what a computer is and what it does
2) Programming classes, e.g. PASCAL, BASIC, LOGO
3) Computer applications classes, e.g. word processor, spreadsheet, database
4) Profession-oriented 'in-service' classes. This classification was divided into sub-categories, e.g. librarians, businessmen, teachers, farm managers, word processor operators, architects and a general 'other' category
5) Classes relating to work skills programmes, e.g. STEPS and YPTP.

Table 2 gives an analysis of the numbers of institutions offering each of these types of course. It should be noted that the figures relate to the number of institutions offering courses and that the number of courses offered per year varied between one and fifteen in different institutions.

Several trends are evident. Most courses being offered at the schools were general information courses. Teachers colleges ran pre-service and in-service courses for teachers. The universities, technical institutes and community colleges organized profession-related courses, which were of

greatest interest to teachers, businessmen and farm managers, in that order. Tutors also mentioned courses for lawyers, accountants, medical professionals, engineers, science applications personnel, hospital services personnel, secretaries and farmers.

Table 2 Types of computing course offered by institutions of adult learning in New Zealand: 1984

Kind of Course	Schools	TIs/CCs	REAPs	Universities	TCs	All
General	140	25	9	6		180
Programming	94	21	2	2		119
Applications	70	25	1	3		99
Professions	17	19	4	6	6	52
STEPS/YPTP	4	16				20

Those institutions which provided computer education classes as part of their pre-employment training, e.g. STEPS and YPTP programmes, were sent a follow-up letter, and responses to this are discussed in Chapter 6.

Changing Trends in Computer Courses

Table 2 shows that similar numbers of 'programming' and 'applications' courses were being offered by the institutions in 1984. This was evidence of a changing trend in computer education courses, since initially only introductory or programming courses were envisaged.

This trend was also reflected in many comments made by the tutors. For example, one wrote: 'the main area of need seems to be applications education. Although general information classes are popular, they seldom require more than 10 hours tuition and only a very few students express any interest in programming. On the other hand there is a huge reservoir of material for applications.'

When the study was concluded at the end of 1987, this trend had continued and there were far more applications courses being offered, mainly in wordprocessing. At schools, by 1987, teachers too were finding good applications programs on which to base their third form work, and were much less likely to be teaching programming.

Difficulties arising from lack of equipment

Many of the comments made in the questionnaires told of the difficulties of providing courses without having suitable resources, both of hardware and software.

One tutor said, 'Sufficient machines are required [to provide] a 1:1 ratio except for awareness/introductory classes where a 2:1 ratio gives a better class atmosphere.' Another commented that, 'The number of machines is a serious problem since the class minimum is 15 and we only have four machines. Hands-on experience is limited. I would like to see more resources available for adult education in the form of computer packages which would be relevant to them, e.g. word processors, farm budgeting programs, accounting programs etc.'

Reflecting on the problem of teaching with such limited resources another remarked, 'Unfortunately the cost of computers in N.Z. means that you need to buy the cheapest available and this means that it is difficult to use - and teach with - and it is very limited in what you can do.'

Other comments related to the need to find sources of funding for computer equipment. One tutor wrote, '[I] wish there was a Department grant for the purpose of buying hardware and software.'

However while acknowledging this difficulty other respondents offered the following ideas as possible solutions:

> A centre for small business people could be established, and a small fee charged for the use of computer facilities.
>
> A general resource library similar to the National Film Library could be set up, providing easy access to material and a quick turn-around time.
>
> Salespeople could be encouraged to lend or demonstrate software or machines to adult classes.

Perhaps the most ambitious solution to the problem of finding funds for computers was the 'information co-operative' jointly set up by Ellesmere College and farmers from the surrounding area. The Principal, reporting on this scheme, wrote, 'One part of our system is a unique combination of farmers and school [using] a System 2800 machine and advanced software - e.g. Farmplan - donated to the school by the farmers.' (This is discussed in Chapter 4).

Tutors - their attitudes and problems

Another frequent comment in the replies related to difficulties in finding suitably qualified staff to teach courses. Tutors for these evening classes have generally been recruited from a variety of backgrounds - from amongst professional computer personnel, trained teachers and enthusiastic amateurs. For example, one writer stated that their programme was, 'run by a parent ... [who] manages a computing firm; many of the contacts are from this source - it has proved very popular.'

Teachers had different reactions to tutoring adults. Some found it stressful, one 'had been plunged into adult education without special training.' However, another said that it was 'the best teaching out - pure pedagogy.'

Some writers commented on the difficulties of teaching, in the same class, students with different interests and varying abilities, and many indicated that they would value support in curriculum development, and would welcome opportunities for in-service training. For example, one remarked, 'suggestions for content [for a] course would be most welcome; perhaps a course outline assuming two persons per machine with programming exercises to be produced and circulated to schools, since many teachers must find themselves catapulted into adult education work with no special preparation.'

Adult students - their attitudes and motivations

Many of the tutors drew attention to the enthusiasm in the adult community for computer education. As one writer noted, 'many were parents interested to learn about computers so they could keep up with the kids and what they are learning at school.' Some also commented on the liveliness of such classes. For example one tutor remarked, 'Most want to know what a computer is - the challenge of some further education. For most this is the first such experience. [They are] determined to master BASIC. [They are] very supportive of each other's efforts - a very social atmosphere. Attendance is always very good.'

However, writers also drew attention to problems created through lack of knowledge about computers. Many students enrolled for courses with scant knowledge of what computers could do and with wrong expectations both of the nature of courses and the level of commitment required to master computer skills. For instance, one tutor remarked that students, 'expect to be able to pick up programming in a couple of days! ... Many lack ... logic ... and have

difficulty with the symbolic nature of programming.' Perhaps as a consequence of this kind of problem another tutor commented, 'The initial enthusiasm for classes does not last and there is difficulty keeping classes going the set time.'

One theme frequently mentioned by tutors was the students' fear of computer technology and its impact on job security. Many expressed concern about, 'the need to dispel the myths and mystery about computers.' One writer noted, 'This [fear] takes many forms, including the way computer courses may be advertised.' But he continued, 'accommodating the computer age is possible without painful reactions if everyone is thoughtful.'

By contrast one tutor wrote: 'An exciting day was spent demystifying the computer on the marae. People of all ages came and went and we are going back soon.'

Problems arising from Departmental regulations

A number of criticisms were directed by the writers at the impact of Department of Education regulations on the organization and the running of computer courses for adults. Some institutions would have liked to offer courses, but where these were already being offered by other institutions in the area, departmental regulations precluded such duplication. Also, evening classes were required to have a minimum enrolment of fifteen, which might in some cases be relaxed to twelve. Where institutions had only one or two computers, such restrictions meant that students got insufficient hands-on experience with the computer. Writers therefore looked for increased commitment to computer education from the Department. They argued for increased financial resources to provide computer rooms and to improve security measures and for regulations to standardize both hardware and software.

The major problem identified by many writers related to the length of courses. Many felt that short courses were appropriate, especially for teaching wordprocessing skills. It should be noted that the Department of Education does now through its regional offices allocate a number of hours to institutions for short courses and seminars, so that this criticism has lost its relevance. Another criticism has arisen however: 'I would like the computer classes classified as 'vocational' - this means more realistic pay rates than if the classification is 'non-vocational'. 'Teachers won't come out at night for peanuts.'

The recent reforms in school administration and funding foreshadowed in

'Tomorrow's Schools', the government report following the work of the Picot committee, are likely to bring new freedoms for schools to present courses appropriate to their own communities. It is likely that the devolution of funding will allow more flexibility in this respect in the future.

Advice about purchasing personal computers

A number of respondents remarked that they were frequently expected to help students select computers for their personal needs and drew attention to the problems they faced.

One tutor wrote, 'Often a small business is involved and home programming is wanted. These don't really mix. The concept of the computer as a problem-solving tool is heavily embedded but not the difficulties in using a small computer on quite large tasks.'

Tutors also commented on their limited knowledge of the range of computers available on the market. One noted, 'at the most I have handled only a dozen of the forty or more microcomputers freely available.' This writer went on to suggest that it would be very helpful to have a catalogue of computers on the market with data about the hardware, software packages and servicing facilities.

When confronted with a request to help in the selection of a computer, tutors generally provided a set of basic guidelines. The following were identified as important factors to be taken into account when selecting a personal computer:[2]

1) Carefully consider what is to be required of the computer, e.g. do not buy a large memory unless it is to be used.
2) Select a popular machine with hardware and software packages that are suitable and readily available.
3) Select a well-established machine in which the 'bugs' have been ironed out.
4) Consider the clarity of the accompanying manuals.
5) Consider the availability of servicing facilities.
6) Consider the proximity of any user groups.

Links and liaison with other institutions

Tutors find both informal and formally-organized links professionally helpful. One wrote, 'I have regular discussions with supervisors of other local adult classes and these enable us to measure comparative progress and to discuss new

ideas associated with the tutoring of computer classes - still a new and experimental concept.' Another commented, 'I have participated in a one week course with tutors from other institutions. ... The exchange of ideas is well worthwhile.'

Liaison between institutions also promotes effective utilization of staff and resources. One tutor based in a community college located in a regional centre noted, 'we can feed people into classes in a nearby town or into the three local high schools to fully resourced classes ... which best meet individual needs.'

Tutors, especially those in rural areas, were interested in establishing better links with similar institutions. One commented, 'I would be interested in feedback on what institutions and schools (especially in areas like ours) are offering, so that we can satisfy the changing needs of our community.'

Advertising and publicity within the community

Tutors frequently noted that courses had been established in response to community need and were not publicized other than by word of mouth, as it was difficult to meet even the existing demand.

In some localities courses were publicized informally, using notices on shop windows, advertising through Parent Teacher Associations and talks to schools.

One tutor wrote, 'In the college centre we have one Poly for 6-8 weeks at a time and we make it available for individuals in classes and from the community, just as a starter. This is really appreciated and my personal recommendation is to make "drop in" facilities available to start people off in a relaxed open-structured way.'

Others advertised computer education courses more systematically through the mass media, utilizing community newspapers and local radio stations. One tutor remarked on the results of such low key newspaper advertisements thus: [we had] 'a lot of interest - over 50 students this year on a 10 week course in a town of 4,500!'

Other institutions advertised vigorously: 'Brochures are mailed to business houses and are available from both the Polytechnic and from computer equipment dealers' and 'we run stands at Trade Fairs.'

One tutor noted that the Department of Labour took responsibility for advertising courses held under its aegis, e.g. STEPS programmes for unemployed youth.

Computer Courses for Farmers

During the course of the survey, it became evident that there was an unfulfilled demand for computer education in the farming sector, and that it should be treated as a separate area for study. (See Chapter 4)

Tutors were surprised at the awareness among many farmers of the potential benefits of computers to the rural industry, and at the demand for computer education courses. For example, one wrote that it was 'surprising to see how many ... farm homes did have computers', and that a course that he had run, 'focussed on computers in farming although it had not been advertised as such.'

This interest was also reflected in other ways. In one institution the tutor of the computer education courses was, 'the local farmer who uses computers on his farm,' while in another region the local Technical Institute had run farm management courses in association with computer education classes.

But by the end of the study in late 1987 the downturn in the rural economy had resulted in farmers showing less interest in computing courses (See Chapter 4).

An Innovative Experiment

In an interesting experiment, the YMCA set up a 'mobile computer school' that travelled throughout New Zealand between December 1984 and February 1986, aiming to increase access to appropriate computer skill learning programmes, especially amongst those disadvantaged by geography or lack of formal educational experience. It offered a choice of 7 different kinds of course for adults and children, and ran about 90 courses involving some 1400 people. Twelve donated Apple computers were used in the project. Constant evaluation was undertaken, in an attempt to make the 'school' as relevant as possible to the needs of the users.

The course designer found that the most popular course was the short (two day) general course, especially when targeted for particular groups, e.g. the retired, or working women. Primary school students gained most from the LOGO course. The more 'serious' type of course, though not heavily in demand, was well attended when run. Less successful were the STEPS/YPTP courses (because of funding difficulties); computer camps (held at the wrong time of year and too expensive); courses for groups of people (little interest from voluntary agencies in hiring out the system) and the farmers/small business courses.

Farmers were found to be very discriminating about software and wanted specific information about its use.

Conclusions

It is evident from the response to the questionnaire in 1984 that there was considerable interest and enthusiasm for computer education in the general community .

Results of the survey showed that 219 institutions throughout New Zealand had during the previous two years offered an average of three courses each year; with twenty students attending each course a conservative estimate would indicate that 13,000 adults in the general community had received some computer education by the end of 1984. Further, this interest had been generated amongst all age and employment groups, including many who had not previously been involved in adult education classes. An up-date of these figures, to the end of 1987, is given in Chapter 7.

The distribution of computer education courses corresponded closely to the distribution of population, with most courses being offered in Auckland, Hamilton, Christchurch and Wellington - in that order. But there was also considerable enthusiasm for computer education in the smaller communities.

The survey revealed the high level of co-operation and communication that can develop between educational institutions and the community when there is a shared commitment to achieving educational objectives. Parents throughout New Zealand have contributed generously to the purchase of computers for schools to enable children to be educated in the use and application of modern technology. Educational institutions have in turn been sensitive to the developing needs of the community and sought to provide the computer education courses required by interested adults.

Some interest was shown in establishing a wider base for computer education; many believed it should be included within the framework of work skills programmes, community resource centres and drop-in centres. However, the knowledge and ability required appears to be lacking among those most interested in achieving this goal.

In a more negative vein there were those who expressed concern about the social impact of computer technology on New Zealand society. For example, some respondents voiced anxieties about the likely decrease in employment opportunities, and others wondered about the long-term health effects on computer operators.

Educational issues were also raised. Some questioned the policy of redistributing educational resources to provide computer education for an elite few. Others argued that the subject of computer education should extend beyond the acquisition of technical skills to wider issues such as the consideration of computer ethics and the importance of societal control over computer technology.

Thus while many respondents were excited by the impact of computer technology and the enthusiasm of those interested in computer education courses, there was an awareness too, of the many unresolved social, educational and ethical problems that remain to be grappled with.

FOOTNOTES:

1. See Jackson, Ivan C. (1983), Offenberger, H. (1984) and Wagner, G.A. (1984).

2. Both the New Zealand Consumer and the Computer Society have produced publications to help those wishing to buy computers: 'What you need to know about home computers', in Consumer, June 1985. Mitchell, K. Ian and Clarke, Bevan J. (1983) Choosing your first computer system. Petone: New Zealand Computer Society, distributed by Pitman. This is currently out of print but is to be reprinted.

3

COMPUTER EDUCATION IN THE INFORMED COMMUNITY: A Survey of Computer User Groups

The objective of this section of the survey was to examine the educational role of Computer User Groups and their contribution to the rise in computer literacy in New Zealand. We are unaware of any similar study of such groups of adult learners in this country.

Research Method

Discussions were held with some Auckland and Wellington Computer User Groups, and their constitutions and newsletters were studied. A postal questionnaire was then constructed and sent to 104 User Groups listed in the October 1984 Bits and Bytes magazine. The questionnaire included 'closed' questions about the aims and characteristics of the groups, as well as about ethical issues, methods of liaison and the dissemination of information within the organization. Space was provided for general comments. The results discussed in this chapter refer to the situation as it was in 1984. The groups are very transient, and changes over a three-year period to 1987 are discussed in Chapter 7.

Response

Seventy-seven User Groups returned the questionnaire - a response rate of approximately 75%. They included the following:

42 machine-specific groups using 23 different makes of computer
21 non-machine-specific groups
The Computer Society - the body of professional EDP people
6 Computer Education Societies (CES)
2 Business User Groups
2 groups with specific educational goals

2 groups interested in the design and construction of personal micro-computers

An 'umbrella group' which provided regional liaison for 15 Auckland groups.

General Information about the Computer User Groups

1) The Computer Society

Established 21 years (at the time of the survey in 1984) this group was 'concerned to promote skills and ethical standards in the Electronic Data Processing (EDP) profession'. While education of the public is not a priority, the Society will make public statements on those issues where the organization is seen to have specialized knowledge and interest. For instance, weekly radio up-dates on computer technology are broadcast by a member of the Computer Society on the New Zealand National Programme.

2) The Computer Education Societies (CES)

The first CES was set up about 1979, while the two most recent had been established in 1982, just two years prior to the first survey. Objectives of the CES are 'to provide information and advice on the use of computers in teaching and learning, to encourage research, evaluate educational software and to co-ordinate groups with similar interests'. Originally established by a few enthusiastic teachers, group membership now extends across all levels of the teaching profession, including tertiary institutions.

3) Two special interest education groups

Two groups had been set up to meet separate educational needs:

1) To encourage and extend gifted children in the use of the computer.
2) To enable teachers and pupils throughout the country to develop computer skills by correspondence. This group also provided a facility for teachers to buy, sell and exchange programs.

4) Two hardware interest groups

One hardware interest group had been established eight years at the time of the survey, the other five years. Their aims were to encourage those interested in the scientific and technical aspects of designing systems for a specific microprocessor or to help those interested in interfaces and

robotics.

5) Two business interest groups

The objective of the two business User Groups was to maximize the effectiveness of the computer for business purposes.

6) The 'umbrella' group

This group was formed in the Auckland region to promote the interests of all User Groups. Among its recent activities it had recently set up a bulletin board system of communication and initiated proposals for a code of conduct among User Groups.

7) Twenty-one non-machine-specific User Groups

Non-specific User Groups were usually of recent origin, with the average time of operation being about two years. These groups are largely made up of enthusiastic amateurs interested to extend their knowledge and computer skills, and their activities tend to be informal and flexible in format. While some appeared to be very successful, others indicated difficulties in meeting the needs of people with diverse ages, levels of experience and interests.

8) Forty-two machine-specific groups

The machine-specific groups formed the largest category of User Groups in this survey. Five varieties of computer had at least three User Groups each, interested in the exchange of information and software relating to these particular computers, and 18 others had at least one User Group associated with the brand. Most machine-specific groups reported rapid growth in membership numbers; a number of them reported some problems in structuring programmes to meet the wide range of ages, interests and experience among the members. Activities ranged from informal social contacts through to structured formal courses in programming. Many of these groups produced their own newsletters and information services and some also offered access to software libraries.

Aims of the User Groups

In the questionnaire a range of possible aims and objectives was listed and respondents were asked to indicate those relevant to their User Group. The

results are given in Table 3 below, in decreasing order of frequency.

It is evident that the aim of most groups was to provide general advice about computers for members or to set up information networks relating to a specific computer. For example, one respondent wrote, 'The main purpose of our group is to help each other become familiar with our particular computer ... so that those of us with more experience [can] guide newer users to avoid the pitfalls [and] teething pains we all encounter.'

Table 3 Computer User Group aims and objectives

Aim	%
Providing expert advice from within and without the group for the benefit of the members.	90
Providing an opportunity for people with similar interests to get together in social fund-raising or other activities	63
Building up a body of knowledge about the hardware/software capacity of one make of computer	55
Building up a library of books and/or public domain software/ hardware/peripherals etc.	54
Building up a library of business applications	47
Encouraging a creative approach to computing	46
Running courses/workshops in programming	43
Obtaining bulk discounts for members from suppliers	42
Running courses/workshops in the use of applications packages	38
Liaison with manufacturers and suppliers	38
Educating groups of the general public	24
Putting on exhibitions to display the 'State of the Art' to the public	16
Formulating ethics to help society to adapt to the 'Information Revolution'	12

More than half of the respondents also identified the social dimension as an important purpose of the groups. One noted, 'The aim of the group is to promote social activities and assistance between users of similar computers.' While some indicated that fund-raising was necessary to cover the costs of administration and newsletters, others pointed out that they did not engage in fund-raising as their group was a non-profit making organization.

However, one of the aims of many groups was the building up of a pool of resources for the shared use of members. These resources varied according to the interests of the User Group but they included magazines and books,

software (ranging through games, educational programs and business applications), hardware and peripherals. Other respondents noted that their groups sought to facilitate access to resources for members by building up contacts with manufacturers and suppliers. Sometimes this was done by members who were associated with computers in their business activities.

Fewer User Groups indicated a direct interest in educational aims and it is noteworthy that those who did, often expressed a preference for informal workshops rather than formal structured courses.

The education of the general public was identified as the aim of only about one quarter of all User Groups. However, it is an important aim for some - especially among CES groups. For example, one respondent wrote, "the philosophy of the club is to use its members' equipment and knowledge for the benefit of society, to encourage people in the use of computers and to provide an advisory service so that they will buy the computer equipment most suited to their needs. The public affected includes farmers, businesses, home hobbyists and children." Methods used by User Groups to educate the general public have included talks given to service groups and youth organizations, open days and exhibitions, the provision of information to schools and newspapers and the organization of courses. The 'umbrella' User Group based in Auckland also organizes an annual exhibition and lecture series which gains media coverage.

Publicity and Recruitment of Members

In the questionnaire the 77 User Groups were asked about the ways used to publicize the group's activities and to recruit members. The methods identified by the respondents are given in Table 4.

Table 4 Publicity and recruiting by Computer User Groups

Method	No.	%
Word of mouth	69	90
Through computer dealers, shops and suppliers	44	29
Advertising through the media	42	55
Display stand at exhibition	24	31
Other methods	10	8

Sixty-nine of the respondents stated that members are recruited by word of mouth, and this is consistent with the picture of User Groups as informal clubs made up of enthusiasts.

Forty-four publicized their activities by advertising through local dealers and commercial outlets. Some groups noted that they had enjoyed close co-operation with dealers especially from those who were also members of the User Group. However, others had experienced only limited support from their local retailers.

Forty-two had recruited members by advertising through the mass media. Eighteen User Groups specifically mentioned publicizing their activities through the computer magazine Bits and Bytes, while CES groups frequently stated that they sent their newsletters to schools. Other groups made regular use of local radio to disseminate information.

Twenty-four stated that they had arranged display stands at exhibitions to publicize their activities and recruit members. Several respondents wrote that they had organized displays at local libraries; others had promoted their activities through local body advisory centres.

Finally, the Computer Society, which has a distinctive role among professional EDP workers, stated, 'We publish our own promotional literature. We are regarded as the authoritative body in this field and people join us for this reason.'

Exchange of Information within User Groups

The User Groups were asked to identify the means they used to disseminate information both among members of their group and the general public. The results are reported in Table 5.

Informal personal contact at the regular meetings was the primary means of exchanging information among the User Group members. The newsletter was also a popular method of communication. However, a number of respondents reported some difficulties in finding the personnel to produce regular newsletters and one commented that their User Group intended to produce a newsletter, 'as soon as someone volunteers to be editor.'

Some of the 15 respondents who stated that they were linked to the 'bulletin board' were members of the system run by the 'umbrella group'. Others indicated that they were in the process of establishing such a system for interested members. One wrote, 'Our group has some members with modems

and is producing modems for sale at cost.'

Table 5 Information dissemination by Computer User Groups

Method	No.	%
Personal contact	68	88
Newsletter	54	70
Mail	45	58
Media exchange e.g. disks or cassettes	39	51
Computerized 'bulletin board' system	15	19
Publications in journals	6	8
Conferences	6	8
Community radio	5	6
Other	4	5

Of the five groups using community radio, four used it just for advertising meetings. At the time of the questionnaire (December 1984), only one group mentioned the Public Domain software broadcast on Access Radio (Wellington).

Other means of disseminating information included formal meetings with a guest speaker, mini-seminars and informal social contacts.

Liaison among User Groups

In the questionnaire, the User Groups were also asked about their contacts with other groups. Sixteen of the 77 groups stated that they had no contact with other groups and 9 noted that they had links through personal contacts only. One respondent wrote, 'contact is intermittent, mainly via friends, there is no invisible college as yet.'

However, twenty-eight groups reported that they had contact through correspondence including the exchange of newsletters and, in some cases, software. Three of this number also mentioned contact with overseas clubs in Canada, the U.S.A. and Australia. Nine other groups reported liaison through the New Zealand Microcomputer Club in Auckland, which, 'is run as an incorporated society hosting several groups and provides a magazine exchange.'

The six Computer Education Societies, having in 1984 recently formed a national organization (the NZCES), drew attention to 'close contact with other

CES societies', but also had contacts with some other User Groups.

Five of the machine-specific groups stated that they had contact or were affiliated with other groups using the same computer.

The branch of the Computer Society which answered the questionnaire noted that they enjoyed 'considerable liaison with the National Office of the Computer Society (two members of the local branch as representatives) as well as ad hoc liaison as necessary with other groups.'

Group Characteristics and the Nature of their Activities

In the questionnaire, the respondents were asked to select, from a list, the description(s) which reflected the character of their group and the nature of its activities. The replies are given in Table 6 below. Multiple replies were permitted.

Table 6 Computer User Group characteristics

Group characteristics	No.	%
Attempting to meet the diversity of members' needs	51	66
Fairly static	25	32
Altering in response to technological change	21	27
Radically different from what it was to start with	5	6
Altering to reflect the changing role of the computer in the community	4	5

About one-third of the respondents stated that the character of their group had remained fairly static since its inception. The characteristics of other User Groups had for various reasons changed over time, for instance, with the increasing number of computers and computer users in the community. There was a widening diversity of ages, ranges of experience, interests and technical needs among the membership of the User Groups. For example, one writer commented that, "members' ages ranged from twelve years into the fifties", while another wrote that, "interests ranged from beginner home computers to business and professional programming." Various groups sought to cater for such diversity with wider ranging programmes of activity. One writer noted, "the need to backtrack on previous workshops for new members", while another

reported, "with over 100 turning up [to meetings] it is hard to cater for diversity of needs both in understanding [the] computer itself and in the variety of uses."

In the need to solve this problem several groups had found similar answers - exemplified by one who wrote, 'In catering for new and advanced members we have divided into two groups, serious and non-serious - games etc.'

Over a quarter of respondents commented on the impact of technological change on the character of their User Groups. In some cases the nature of the membership had changed - as one writer noted, 'From enthusiast to business-man'. In other cases the changes related to the demand among members for increasingly sophisticated hardware and the associated knowledge required to utilize it effectively. While some User Groups looked to their own resources within their club to grapple with the challenge, for example, of building modems, others, 'looked to the manufacturer [of their computer] for enlightenment.'

Five respondents noted that the character of their User Groups had changed radically since their inception. In several instances this reflected a change from a specific to a more general focus of interest in the User Groups. One respondent for example reported that the group had begun, 'with emphasis on education' but was 'now more general'. However, another large User Group drew attention to its transformation from a small amateur group to a large 'N.Z. wide professional body'.

Four replies also reflected the impact of the changing place of the computer in the community. In recent years the computer has been transformed from a fascinating novelty to a necessary utility, and several groups noted that as this had happened they had changed their emphasis from the construction and assembly of computers to the effective use of ready-made micro-computers.

Ethics and the Computer User Groups

Computer ethics has become increasingly a matter of public concern as the need has grown - for both personal and commercial reasons - to protect access to confidential databases. One object of the survey was, therefore, to find out about ethical problems that User Groups might have experienced. In the questionnaire the User Groups were asked to list problems that they had encountered in the following areas:

1) The misuse of information, e.g. theft or abuse of membership lists
2) The misuse of User Group facilities, e.g. interfering with bulletin board systems
3) The illegal use of computing knowledge, e.g. attempts by members to gain access to restricted databanks
4) Copyright problems
5) Other ethical issues.

Forty-eight of the seventy-seven User Groups did not list any experience of ethical problems, and several confirmed this in additional comments in the section provided. The largest ethical problem confronting User Groups was the matter of copyright, with 25 of the 77 respondents listing difficulties in this area. Among the User Groups there were wide variations in awareness of the problem. While one writer acknowledged 'massive copying and the distribution of commercial software', others suggested that there were only some, 'minor problems mainly with commercial games'. Another respondent said, 'We stress that the club is not a pirating agency; we deal only in public domain software', but 'some members will copy whatever they can get.'

The misuse of information and the need to restrict access to membership lists in case of theft was identified by eight respondents as a matter for concern. Some simply reported that they were aware of the dangers and had taken precautions against the misuse of membership lists. For example, one noted that in their User Group, 'addresses and the equipment owned [by group members] were not published.' At the time of the questionnaire, no User Group had experienced problems with the misuse of club facilities such as tampering with bulletin boards.

Conclusions

This survey of Computer User Groups shows that the central aim of most was the provision of information services and resources for their members - either by drawing on members' skills or by facilitating access to experts outside the group. They also provided an opportunity for members to meet people with similar interests and to pool resources. The User Groups therefore played an important educational role among members.

Although most groups did not set a high priority on the education of the general public, this did happen to some extent through displays and exhibitions. The umbrella organization which linked 15 User Groups and ran a

successful annual exhibition in Auckland took a particular interest in both the education of the general public and the formulation of computer ethics as part of its wider community role.

The Computer User Groups were a phenomenon of the period 1984-87, involving large numbers of people. Today they seem to be in decline, except for the Computers in Education Societies, which are specifically concerned with computer education and are now linked in a national body (the NZCES), which has held two national conferences. Many members are teachers and their primary object is the effective use of computers in schools.

The Computer Society is in a separate category to the other Computer User Groups. Pre-dating the era of personal micro-computers, this is the official body of the Electronic Data Processing profession, and is concerned with computer ethics, with setting standards of professional practice and with the education of the general public regarding these matters.

4

COMPUTER EDUCATION FOR FARMERS:
Farming Applications of Microcomputers

From tutors' replies to the first questionnaire in 1984 (Chapter 2), it seemed that there was a demand from the farming community for computer education. In pursuing this, I tried to find out what farmers required of a computer system. I spoke to companies writing and marketing software and tried out their programs, visited the Kellogg Farm Management Unit at Lincoln College and visited Ellesmere College, in Leeston, whose farmers' co-operative is described in Chapter 2. I obtained copies of New Zealand farming journals and of 'Wagmag', a New Zealand journal for women in agriculture. I was also co-tutor in 1985 in a joint computers-in-education computers-in-farming course in Pongaroa, a rural area in the Wairarapa, and taught there again for REAP in 1988.

New Zealand's agriculture and horticulture are a prime resource, but the last 15 years have seen much change. Initially this was because of the withdrawal of assured markets when Britain joined the Common Market, so that there was pressure on farmers for critical assessment and diversification. More recently, during the three years of this study in fact, there have been changes in government policy and related financial hardship.

Under pressure to diversify some years ago, farmers were receptive to new ideas of farm management and were prepared to consider incorporating, as part of the initial outlay, computer hardware (even though it was relatively expensive), interfaces (such as dataloggers for reading ear-tag bar-codes), and software (farm management or breeding programs). With the current economic downturn farmers are less likely to start computerizing unless they are convinced it is cost-beneficial. The decreasing cost of computer hardware is a help here, however, as is the increasing amount of expertise available.

Most of the information in this chapter comes from responses to our third questionnaire, namely, the follow-up questionnaire to tutors at the end of 1987. This asked them to note any changes they had observed from the farming community in the demand for computer education, and requested comments on

farming software and applications packages. Many tutors replied that they were not in rural areas so had 'no idea', but a representative collection of comments, from the 21 tutors who did reply, is given below.

A Southland respondent observed: 'Farmers see computers as a way of controlling what is happening on their farms: inputs, outputs, returns on investment, as well as stock records and information flow generally. Farming software is usually available with powerful applications if there is suitable hardware.'

Whereas three years before, tutors reported that farmers, 'don't know what they want', in 1987 tutors reported that, 'the general level of computer literacy among farmers is surprisingly high; if a farmer comes asking for information about computers he has clear ideas about what he wants, is discriminating about the software and has learnt that it doesn't much matter what hardware he gets as long as it runs the software.' Most farmers now opt for IBM-compatibles or systems that run MS/DOS.

The increased level of computer literacy among farmers may be because adult courses have been doing a good job in the past few years. (For example, introductory courses on 'Computers on the Farm' have been run by Lincoln College for 6 years now, and tutors have been active in community courses since about 1983.) Or it may be because farmers have been seeing friends' systems in operation, or watched demonstrations by salespeople. The media, in radio programmes such as the 'Down to Earth', or in the New Zealand Journal of Agriculture, which runs articles on Computers on the Farm, provide another way by which farmers can learn of successful computerized systems in operation. So do Agricultural Shows.[1]

Tutors' Responses

Given that personal computers themselves were new, let alone such specialized applications for one group of people, how did tutors cope with requests from farmers?

Particular requirements

There has certainly been a need for introductory courses. For instance: 'The diversity of home computers can be confusing to one coming in to learn on another type of machine: basics can always be taught but sheer diversity in agriculture and horticulture can pose problems where software is concerned.' 'The problem is that farmers don't know exactly their requirements.

Commercial databases, spreadsheets, wordprocessors [are] perfectly OK for some needs'.

An early experience was as follows: '[The class] had already done half of a 26-week programming course, so we spent the rest of the time trying to write farming software. We did produce an "embryonic" program for a local rabbit stud and the exercise was useful because the farmers realized that they were not really interested in programming; they wanted good applications packages.' However, as another tutor found, 'There is a shortage of good farming software; my own experience as a farm advisory officer and farmer confirms this!' Another tutor says, 'Farming software is still conspicuous by its absence.' From a rural area school, where a night class was run solely because of interest by farmers, the tutor comments on, 'the reluctance by companies to supply demo disks without considerable payment e.g. $70 for a non-working disk', adding that, 'a catalogue outlining software and companies dealing with farming, would be useful'.

Resources for tutors

One way in which tutors have met the problem is to find alternative sources of information for farmers. For instance, farming software was found to be, 'too expensive. We are close to a Farm Training Institute which is in a better way to demonstrate this area and advise.' Elsewhere, 'there are three people offering either services or software to farmers and MAF is also advising in the area'. Also, 'In our area people with special interests (such as farming, pharmaceutical) tended to have their needs catered for by firms marketing specialized packages', so that, 'people are using farming software but do not require courses.' There is still a need for the course tutor, however: 'There may be courses/software etc. but it is very difficult to get objective, unbiassed advice. People don't know what they want till they have the skills - chicken and egg situation.'

Types of needs

Some of farmers' needs are very similar to those of managers and 'small businessmen'; in fact one software company told me that their programs were tailored to 'managers who happened to be farmers'. Another farmer now actively involved in the marketing of his software was pleased to relate that, 'This budgeting program ... has been bought also by small businessmen although it was designed for farmers.'

Bearing this in mind, tutors have found that, 'our business computing

courses are able to meet SOME of the needs expressed by farmer participants' and, 'many application packages can be tailored to meet the needs of farmers'.

Other kinds of programs required

Articles in the New Zealand Journal of Agriculture show many imaginative and effective uses of computers as integral parts of farms, such as the 'computer which does superfine merino selections' on a Central Otago sheep station. This breeding program analyses data on the quality of the wool fibre and has records of about 30,000 animals which have computer-readable ear-tags. However, although tutors can describe and discuss such systems, 'the school budget does not run to much educational software let alone small business and other farming applications. Similarly we cannot show automatic weighing/-identification tag interfaces nor even remote database accessing as we cannot afford a modem.'

Specialized breeding programs are complex (they differ according to the animal being bred) and some farmers use the services offered by the Ministry of Agriculture and Fisheries (MAF). There have been problems with companies which offered a service to farmers but were unable to maintain this due to lack of personnel, perceived high charges for advice or distance from the farm.

And what would the farmers' ideal software package contain? 'Full enterprise analysis, sufficiently complex that a single entry will be fed into the program automatically where relevant, with entries under the headings of stock reconciliation, paddock histories, fertilizer per paddock, expenditure, tax, GST, cashflow all automatically updated.'

Changes during the past three years

Over the past three years the situation has changed from that initially surveyed in 1984. There has been reduced interest from farmers who previously were considering experimenting with the computer. Typical comments are: 'The clamour for farmers' courses has died down' and, 'farmers have not patronized the courses that we offered them, in spite of us taking the courses out to them in country locations'. 'A downturn in the economy has led to fewer enquiries from this group. And it is always difficult to find a suitable time for a course that suits all.'

Those farmers who have already computerized find that they have overtaken the hardware capacity of the schools. For instance, one tutor commented that 'reducing demand since 1985 is probably due to our being tacked to school

computers whereas most of our local farmers are using IBM compatibles.' Farming applications programs now being written need MS/DOS capability. Also, 'in our community many farmers want to see applications packages and how computers can help them. We have been limited because there are few programs available to us in this field and IBM programs are too expensive for a secondary school to buy.'

And here is the rest of the story of the Ellesmere College co-operative: 'The Farmers Co-operative was planned for 5 years. Now their co-operative has finished. The school now owns the computer and most [of the farmers] have purchased their own.'

Agricultural Colleges

No replies were received from farming tutors at Massey University, although some Departments were known to be very active; the Veterinary Clinical Science Department, for instance, uses computers extensively, and I visited them to discuss their work with pig-breeders. From Lincoln College came information not only about the Kellogg Farm Management Unit, but also about: 'mostly two-day [introductory] courses, about 100 people a year. The demand is certainly country-wide, and those attending our courses today are more the "average farmer" than was the case in 1984. There is certainly less interest in programming than there was previously. We like to think our software is more than adequate for the use it is designed for. Software generally is much more adequate than it used to be. Interest in our courses stems from what is going on in the rural community'.

Conclusions

An informal estimate made to me by a software firm is that about 2 percent of the 40,000 farmers in New Zealand (some 800 farmers) are making use of computers on their farms. There is considerable room for expansion here.

Many farmers' needs can be met by courses in adult education. Most tutors have sufficient resources to allow them to give an introduction to the computer (what it can do and what it can't), and can present generalized applications such as wordprocessor, spreadsheet and database in such a way that they will give the farmer background in looking for more specialized material. However, the farmer may be advised thereafter to go to courses offered by agricultural or technical colleges. The background from introductory courses will also give him information so that he knows what to look

for when buying hardware or software. Some computer salespeople also give tuition or supply advisory services.

A few farming programs suitable for school computers do exist, usually of the accounting type, and of various degrees of user-friendliness. It is also possible to use spreadsheet programs to make farm management decisions. However, writers of farm packages are now writing for more sophisticated machines, and no one appears to be writing the kind of program that tutors would like, namely, a program just for teaching purposes, to show what can be done with computers on a farm. Business software is sufficient for demonstrating some farm management practices, but good breeding programs or farm simulations for teachers do not currently appear to exist in New Zealand.

FOOTNOTES:

1. The means by which farmers gain information is the research topic of a recent J.R. McKenzie Fellow, Ken Moore, who is currently carrying out his investigations in the Canterbury area, with assistance from NZCER staff.

5

COMPUTER EDUCATION FOR TEACHERS:
Some Suggested Topics for Computers in Education

In the questionnaires which they returned, many computing tutors commented on the need for in-service training for teachers, 'so that they can continue to be up-to-date in such a rapidly changing field.' It is not only computers themselves that are changing, but also ideas in the teaching community as to the role of the computer in education. This chapter examines this role and looks to the future.

As regards technological changes: electronic computers have been in existence for over 30 years, and some mathematics teachers used punch-card input and time-sharing on mainframe computers many years ago. But the advent of the relatively cheap microcomputer sparked off a completely different attitude to computer teaching since one could for the first time use computers interactively. Now teaching strategies continue to change as the hardware and software change; for example, graphics programming and technical drawing are transformed with some of the new forms of CAD.

As regards changing attitudes to computers in education: with the advent of the microcomputer in schools it was keen teachers and 'self-taught enthusiasts' who put the time into learning how to use the computers, and deciding how and what to teach with them. A New Zealand-built computer (the POLY) was proposed for use in schools, but there was much controversy about whether it would be necessary; was there in fact going to be a need for computers in all schools in New Zealand? Schools proceeded with the purchase of computers nevertheless, and local Computers in Education User Groups sprang up across the country as teachers began to work out for themselves how they could use computers in education. When the Department of Education appointed a Computers in Education Development Unit (now CEDU, formerly CCDU), resources were provided for computing teachers. Initially these were for computer awareness, for pupils first coming into contact with computers at secondary level. In the next four years expertise in using computers in education has spread widely so that now even primary schools are using computers, often as

part of a 'process writing' programme. The CEDU currently (1989) produces resource booklets, runs training courses, supplies advice and issues a newsletter so that teachers' experiences can be shared. Research is being carried out in the use of computers in education, including a series of evaluations of 19 exploratory studies conducted by NZCER in association with the CEDU. The changing attitudes to the use of computers in education are also reflected in new teacher training curricula.

Continual change faces computing teachers, including tutors of adult classes. For instance, as noted in Chapter 2, programming was taught initially, but the current demand is for applications courses. This means that the tutors have to put much time and effort into obtaining good software, learning how to use it themselves and how to teach its use.

This chapter, at the risk of seeming out-of-date as soon as it is written, includes some ideas and suggestions concerning material that could be presented to teachers who will teach computing or use computers. These suggestions are the result of discussion and correspondence with lecturers and tutors at Wellington, Christchurch and Auckland Teachers Colleges and at Massey University. The chapter begins with a summary of the courses now being taught, and ends as tutors 'dream a little' and imagine what may be required in the future.

Courses Taught at Teachers Colleges

As noted in Chapter 2, the seven teachers colleges were included among the institutions surveyed in 1984. Replies were received from Wellington, Auckland (2 Departments), Christchurch, Hamilton (2 Departments) and Palmerston North Teachers Colleges. They reported on a disparity of resources ranging from, 'having to borrow machines for our courses' to 'a well-equipped computer centre with extensive hardware and peripherals on trolleys and a well-developed security system.' Palmerston North was offering no courses at the time. At Christchurch Teachers College, staff were actively involved in developing videos for computer teaching and a staff member, Michael Wall, had written a textbook on computer awareness. I visited Wellington, Christchurch and Auckland Teachers Colleges in 1984 and 1985 and have been in touch with them since then and asked about changes during these three years. I also spoke to Dr. Ken Ryba who ran the course on Computers in Education at Massey University.

The task of the Teachers Colleges is primarily to provide pre-service

training for student teachers but they also provide in-service training for practising teachers.

Wellington Teachers College trains teachers for the primary service. Here computer education courses emphasize the effective use of the computer in teaching the curriculum, including mathematics, Maori Studies, health, music, geography and science. The students write some software and much of it is shared through the POLY Users Group. Computer Aided Instruction (CAI) has its place, enabling children to work at their own pace, practising and repeating work as necessary. However, there is concern that teachers develop a critical approach to CAI, as well as the capacity to analyze whether or not the computer is the best medium for teaching a given topic - could one do better with chalk-and-talk? Much use of computers is made by English-as-a-second-language students, and children with special needs are also catered for.

For many years, Wellington Teachers College has offered a 12-week in-service training course with 4-hour sessions one evening a week. The course, designed to train teachers to use computers as an effective teaching tool, has been oversubscribed. A new presentation was tried in summer 1987-8, namely a residential block-course 8 hours a day for five days. This was more convenient for those living outside Wellington and was very successful. In these courses, 'the demand for knowledge has shifted from hardware to software and we now offer authoring as well'. This College also runs relatively short introductory courses for educational administrators, advisors, teachers and parents.

Christchurch Teachers College, 'places emphasis on computer uses rather than computer science in the College courses. This ... reflects the current trend in school programmes to lessen the time committed to studying the computer per se and programming, in favour of more time familiarizing pupils with "applications" software such as word processing, data bases etc., as well as promoting an "across the curriculum" concept of Computers in Education.'

Courses are theoretically available to both secondary and primary trainees, but timetable constraints effectively restrict participation to secondary trainees. Courses for primary trainees should be in place next year. Of a total secondary roll of around 220 trainees in 1987, about 140 had enrolled for one or more courses. Most of these do the introductory course 'Computer Literacy for Teachers', with an average class size of 10-15 for the

other courses.

The Director states:

> Were money and time no object, I would probably not extend the pre-service commitments greatly, (except perhaps to offer material on interactive video), nor would I get the trainees doing extensive in-school research etc., at least not until the in-service needs of teachers already in schools have been met. What I would like to do is get involved with a group of experienced teachers who use computers in their classrooms who would be freed up (e.g. by secondment) to work alongside other teachers in those teachers' own classrooms. Most teachers get little opportunity to attend in-service courses, and when they do they more often than not have insufficient exposure to take any really useful strategies back to their classrooms. What they would benefit more from is having 'experts' in their own subject area (i.e. not 'computer buffs' from the Maths Dept. or whatever) work alongside them, in their school, with their kids, introducing strategies appropriate to their needs.

Auckland College of Education, runs pre-service courses with the aim:

(a) first to give trainees the skill and knowledge which they require to become computer users - largely through the use of applications - specifically wordprocessing. We believe that teachers will not be able to use computers effectively with school children unless they have personally used them;

(b) next to give them skill and knowledge to use computers in the classroom in a variety of ways which vary according to level, ability, subject, etc. An emphasis on the learning that is occurring rather than the software or the equipment;

(c) from these approaches a lot of learning about computers will occur incidentally (and is planned for).

They also run in-service courses, and report the following trends:

(a) less interest from secondary teachers and more from primary;

(b) more interest in specific courses rather than general 'introductions' (although these are still popular with primary teachers - indicating that there are many who are feeling a pressure to gain skills in this area).

(c) The Auckland Computer Education Society has begun running courses for teachers too, and some of these have been popular (particularly one aimed

at teachers of junior primary children).

The Director also reports:

> It would be nice to be able to offer a course for trainees which would enable them to work in schools with children and teachers and computers in developing units of work and approaches to using computers outside these restrictions.
>
> An action-research approach would also be good for in-service courses - it would be good to get teachers who were given a number of days spaced throughout the year, who would spend an initial period developing personal skills and then go back to their classrooms with equipment and software provided by the College (or Education Department) to try out ideas with their pupils, to develop curriculum materials and return back to meet at regular intervals to develop their skills and discuss their joys and problems and observations. I would love more time available within the College year to develop trainees' skills and knowledge more thoroughly. I would like to be able to develop a 'cross-curricular' course in information skills which related to practical research that trainees were doing, using computer tools.'

Massey University runs a very successful correspondence course called Computers in Education: This is:

> ... designed for people who have little or no computer experience as well as for those who have specific interests and skills in computer education. The main aim of the course is to provide experience and information about the best ways of using computers to support student learning.
>
> The course introduces the main educational uses of computers in New Zealand. This involves a study of the ways in which students can learn <u>from</u> computers and <u>with</u> computers. Hands-on experience with a variety of educational software is provided during the winter school. This covers such topics as LOGO programming, drill and practice, tutorials, simulations, educational games, word processing, data bases and spreadsheets, together with an introduction to new developments in computer communications, including electronic mail, bulletin boards, teleconferencing and the use of remote educational data bases.
>
> Emphasis is placed upon 'education with computers' with a close link between theory and practice. Attention is given to recent national and international developments, current trends and problems, and the

application of research findings to practice. A critical examination of computers in New Zealand education is conducted with regard to policy and philosophy, ethical and social issues, and the evaluation of educational software.

The course tutor notes:

> My brief thoughts on the matter of teacher training are that we have paid far too much attention to the technical aspects of computers and far too little attention to the pedagogical aspects. More emphasis needs to be placed on the learning process as opposed to the learning of content. The field of computers in education tends to be technocentric and there is a need now to examine the place of computers in the teaching and learning process. This should include attention to the role of the teacher and the development of social learning climates. The computer is but one element of the computer learning culture and we must place this in perspective. We have gone through a period of naive optimism about the role of computers in education and now it is time for some serious evaluation and criticism about where we are headed.

Conclusions

The computer is no longer the preserve solely of mathematics and science teachers. Nowadays virtually all teachers are likely to encounter computers in some way and must know something about them. Mathematics and science teachers may need to be able to program competently, but other teachers may need to be more au fait with current applications.

Teachers are often concerned with the practicalities of computer use. If there is money for only one or a few machines, should they be put in a computer-room and rostered, or should each class or syndicate have one in the classroom for use just like any tool? How do we ensure respect for hardware, ethical use of software, respect for other children's programs stored on the same disk? Are there virtues in children working in pairs, to discuss their work? Are larger groups feasible? Also, as regards software, how do you best incorporate a wordprocessor in process writing? And should children be allowed to play computer games? (This last question will become more and more controversial as the quality and variety of 'games' improves: already adventure games are regarded as teaching problem-solving, perseverance and co-operation.)

As the general level of computer awareness in schools increases, the

content of introductory courses in computing will change, perhaps having more of an 'information technology' bias, certainly altering in response to new technology and to new findings on the use of computers in education. Computer Aided Instruction has its place, and teachers must be able to apply criteria for well-designed CAI. It is certainly excellent in many drill applications, and in remedial work.

What of the future? What will be the role of the teacher in, say, 40 years' time? It may be fitting to conclude with some predictions made by K. Ian Mitchell in a 'Harbourview Seminar' organized by the Educational Administration Society in October 1984:

'Education for the future must equip many with knowledge skills, and most with skills to cope with successive retraining throughout their forty years of active, adult life.'

'The computer could be a dominant factor. Not only are the skills of computing needed to get access to the vast bodies of knowledge in our information-based systems, but they are also necessary to develop the thinking skills of the future ... as a bonus acting as a writing tool allowing the assemblage of ideas and manipulation of text to a degree not previously possible.'

'Computers will be the most valuable learning tool given to teachers since chalk. They will be used in every aspect of education. In the next few years we must change our curricula to accommodate our new social needs. But we must also develop our teaching techniques to keep pace with children living in a world which can achieve at intellectual levels never before possible'.

FOOTNOTES:

1. Children learning in this way are discussed in Sherry Turkle's book 'The Second Self'.

6

COMPUTER EDUCATION FOR TRANSITION GROUPS: The Use of Computers in Work-Skills Programmes

The Department of Education has used the term 'transition group' to describe those young adults who have left school and attend work-skills courses at Polytechnics and Community Colleges before finding places in the work force. These courses were termed STEPS/YPTP during the survey in 1984, and were part of ACCESS training in 1987. A survey of computer use in such courses has been carried out by the Department of Education.[1] In this chapter we present tutors' evaluations of computer education courses which are part of such programmes. The report ranges across all centres of adult learning, and includes computer education courses run in schools as well as CALP (Computer Assisted Learning Programme), the work-skills project in Dunedin.

Response to the Questionnaire

Fifteen replies from the original survey in 1984 were from tutors of work-skills programmes for transition groups. We asked those tutors for further information regarding curricula and course evaluation. One reply which dealt with the use of computers for the disabled did not fall within the scope of this research project as this topic had been studied and reported elsewhere.[2] It was evident from the responses of the remaining fourteen tutors that computer-based courses in transition and work-skills programmes have been developed for three main purposes: to teach educational and remedial content, to develop a general computer awareness and to teach the use of computer applications packages.

It was said that the attitudes of transition students to computer courses 'covered the whole range from fascination to fear'. Many students suffered from low self-esteem and few had been in classes at secondary school which offered access to computer education. Several tutors commented that successful hands-on computer experience had noticeably improved the self-image of many students. One supervisor noted the increased levels of cooperation

when students worked together on a computer; others wrote that with support and encouragement many who lacked interest at the beginning of courses gained confidence and enthusiasm.

It was seen that younger students, particularly, needed sensitive direction to plan courses suited to their interests and abilities. Several tutors commented that the most effective teaching programmes for transition students were designed as short modules of work with plenty of hands-on experience. One said: 'The normal classroom teaching approach is not suitable - some progress is made by sitting in a group and holding short chat sessions to fill in the background to the work they are to do plus the injection of some theory; hands-on experience is the only way to get through to most students.'

Many tutors found that computers were of real benefit in teaching educational content. One supervisor using the computer to teach English as a second language, wrote: 'all responded very positively and responsibly both to the language experience and the "hands-on" computer contact experience.' Others mentioned the advantages of computers for remedial teaching, since 'success and failure is a private matter between the student and the machine, and the student can make mistakes without feeling humiliated'. One tutor wrote: 'the use of computers results in increased concentration because individuals can work at a self-selected level and at their own rate of learning.'

A number of supervisors reported constraints imposed by the limited access to suitable equipment. Others commented favourably on the increasing range of software directly relevant to these courses, e.g. from the CALP.

One respondent who had oversight of several computer education courses in transition programmes suggested that their effectiveness depended largely on the confidence and enthusiasm of the supervisors, who were generally as new to computers as were their trainees. This writer added that before evaluating the courses it was essential to provide supervisors with the necessary training and back-up to enable them to teach effectively.

A few tutors expressed reservations about the usefulness and effectiveness of the computer courses. One wrote: 'In my most cynical moments I feel that the computer sessions are about as useful as a visit to an inferior video parlour. However, I also accept that if the students' contact with a computer contributes to a broader knowledge of their world and to their employability then such contact is worth making.' Most tutors and supervisors appeared to feel optimistic about the courses, stating that students had

clearly enjoyed and benefited from the educational experience. A number of tutors noted that they had developed more structured courses for students interested in programming courses, and others stated that students had gone on to attend other formal computer education courses. One commented, 'we have found that in several cases the more highly motivated students have moved on to a regular two hours per week night class on Introductory Programming and in a couple of cases to a full-year Computer Fundamentals course of four hours per week.'

Conclusions

Summarizing these tutors' comments, it seems that computer-based education programmes can be of considerable assistance to young people who for one reason or another have not had good learning experiences at school. With suitable software and carefully defined objectives, computers can be used to teach educational content (e.g. remedial courses), computer awareness and the use of computer applications. Success in these activities can build self-esteem, remove apprehensions about computers and perhaps lead to the development of computer-related skills in programming, wordprocessing or as a VDU operator.

Several factors contribute to the success of such courses. It would appear that positive results are best achieved by carefully structured courses directly relevant to the needs, interests and abilities of the students. Other factors which affect outcomes are the attitudes of tutors and students both to computer education and to each other, as well as the cost and availability of hardware and the quality of software.

While it is obviously unrealistic to expect that a few hours a week with a computer will remedy problems which have developed during years at school, computer-aided learning with its capacity to be patient, repetitive, interactive and fun, and with its privacy in success and failure can be of much benefit to students in transition courses. However, care needs to be taken to insure that the 'tone' of the software is supportive and the vocabulary used is appropriate.

FOOTNOTES:

1. Bright, Stephen (1985). Computer Development in Transition Education Pts I and II. Wellington: Department of Education. (Pt II is in preparation and will cover relevant software).

2. Cranshaw, Adrianne (1986)

7

COMPUTERS AND PEOPLE:
An Evaluation and Some Conclusions

The objective of this work was to research the needs and provision for adult education in computing in New Zealand. After the event it is clear that this is a report not about computers but about people.

Thus we do not talk about how computers work, but we do give a framework (Chapter 1) for teachers who want to discuss what a computer is and what it does. We do not compare different brands of computer, but we do give some guidelines (Chapters 1 and 2) so that people can be advised as to buying a computer. We do not compare the merits of specific educational software but we do give Teachers College tutors' views (Chapter 5) on what teachers could learn about the educational potential of computers. We do not discuss how to start using a new computer or package, but we do dissect the raisons d'etre of amateur Computer User Groups (Chapter 3).

The human element dominates in every topic we discuss. We have learned (Chapter 2) of people who are initially intimidated by the new technology, who need the support of working in pairs in order to get started with 'hands-on' experience, but who persevere in order to enter (or re-enter) the computer-oriented workforce. We have learned (Chapter 2) of parents who raise money for the school in order that their children may have the benefit of computer education, and who go to classes themselves in order to be able to assess the salesman's claim of, 'Give your child an unfair advantage, buy him a computer'. We learned (Chapter 2) of the idealism behind a YMCA project aimed at bringing the new technology to remote New Zealand, and of the real-world limitations in its implementation: car breakdowns, logistics problems, tutor stress.

I and my family learned of the warmth of a small rural community when we appeared in their midst to run a two-day course on Computers-in-farming/Computers-in-education early in 1985, and we learned of the changes in that community when we ran a repeat course in 1988: some farmers had indeed computerized successfully and told us of good farming software, but the issue of whether or not to computerize was of lower priority now than it had been.

When all is said and done, I was told, you can't get the computer out on daily fence inspection. On the other hand I was impressed by farming software in use at the Veterinary Clinical Science Department at Massey, where computer programs are better than humans at diagnosing epidemiological patterns. But even here the programs are given imaginative names like PIGCHAMP, so there are people 'behind' the computer.

In assessing teaching software, when the computer is in TUTOR mode so that the user sees only what appears on the screen, one also becomes clearly conscious that 'behind the screen' are people, namely the programmer and the teacher who designed the program. Educational software is only as effective as the teacher who wrote it.

An innovative advisory service was run for about five years by the University of Otago Extension, and was obviously in touch with what people wanted. It was initially linked to a BBC television series on 'The Computer', and so was advertised in the New Zealand 'Listener'. Thousands of people wrote to the advisory service asking for information sheets and for other advice about computers. An excellent programme called CALP has been run by the Salvation Army/Rehabilitation League in Dunedin for many years, concentrating on producing excellent software for 'Transition' education (Chapter 6).

Two new programmes have now begun. One is the opening of new horizons in distance education, currently focussed on rural women and centred on Waiariki Polytechnic; emphasis is on using new technologies in distance education. The other is a Maori language teaching programme run by the Kohanga Reo Trust using hardware and software designed by the New Zealand firm Progeni, including a excellent voice synthesizer; an adult student who had used this said that it was effective and had 'a good Maori accent'.

How is it that a study of computer education has given so much information about people's reaction to 'the computer'? One reason could be that adult education courses in New Zealand do not come 'from the top down' (i.e. by decree Thou Shalt Learn This) but from popular demand. Courses are offered in response to demand; if too few people register, the course is cancelled; if courses are over-full, more are laid on. Thus a study of courses offered is also a study of what people want to know. And the comments of tutors tell of their own feelings as well as those of the general public whom they teach.

New Zealand is a small country of 3 million people with a relatively homogeneous population, (currently) a relatively centralized education system,

and facilities for the rapid spread of information both by telecommunication and by personal contact. This homogeneity is reflected in the fact that widespread consensus was found in tutors' attitudes and problems, as well as in the reports they gave us of adult students' attitudes to computers. Some general patterns emerged from our nationwide study over the three-year period 1984-87, and these have been discussed in the body of this report. Some additional details are given in Table A1 in Appendix 4, and will be discussed here.

This table lists the estimated numbers of adult students taught in computing classes run by 71 schools during the period 1981-87. The information was obtained from one of the 'follow-up questionnaires' sent at the end of 1987 to those tutors who had replied in the affirmative when asked in 1984 if they taught such classes. The total of 71 schools represents only about a 50% return for this later questionnaire, so the total number of adults taught in all the schools is likely to be about double the total given, i.e. about 25,000. A further 30 replies to the same follow-up questionnaire represent about 50% of the tutors at institutions other than schools. We do not give the latter figures here because we suspect that the Polytechnics may have included figures for career/professional courses in their totals, and this study explicitly excluded other than general interest courses.

From these figures we obtain a conservative estimate of 30,000 people as the total of adult students taught computing over this period, i.e. about 1% of our total population. Small wonder that tutors in 1984 reported feeling 'swamped' by this demand for courses in a relatively new subject, with no syllabus and in many cases no previous experience in teaching adults. Even three years later, in 1987, there were requests for a clearly defined syllabus for such courses, for in-service training and for support. Much support is now available, for primary and secondary computer teaching, from the Computers in Education Development Unit of the Department of Education (CEDU), and there have been recommendations[1] for similar support for tertiary tutors. However, with the implementation of the recommendations of the Picot Report on education the role of the Department of Education in supplying resources is being re-assessed. In the field of computer education it may eventuate that resourcing is done by the NZCES, or by other groups of involved teachers.

Table A1 in Appendix 4 does not give the name of the school but it does give the region, ordered geographically more or less from north to south. Very approximate population estimates[2] are given for each region, drawn from the Monthly Abstract of Statistics of the Department of Statistics. They are

the estimates as at 31 March 1984 of communities, urban areas, cities and boroughs, many of which overlap to some extent so that the figures are only a guide as to whether the region was rural or urban. Schools in the Greater Wellington Region have been given as part of Wellington, and similarly for Auckland.

In many sets of figures the total number of students taught each year is initially small, then increases, then may decrease again after a few years. Thus we have many examples of the S-shaped innovation curve described in the Preface, with some regions much further advanced than others along the curve. The high percentage of adult computing students in some of the smaller communities is worthy of note.

The follow-up questionnaires in 1987 asked for more than just number estimates. The covering letters listed the findings of the 1984 survey and asked for comments and opinions as to whether the summary statements included were still true, as well as for changes noted after the lapse of three years. Some changes of attitude were reported by tutors. It seems clear that over the period of the study the computer has changed from a 'threatening' innovation to an accepted tool (which may or may not be relevant to any particular individual). These changes should be seen in the context of the rapid social and economic change which has swept the country during the last three years. In particular there is less job security and rising unemployment. The rural economy has experienced a severe downturn and this has affected the attitudes of farmers towards computers. Today, farmers who seriously consider computerizing their operation are very explicit in their demands for software and they also comment that the kind of farming programs available for 'those little machines you've got in the schools' are not of use in the real world of IBM compatibility.

Whereas Table A1 showed figures for the Adult Classes surveyed, Table A2 shows similar figures for the Computer User Groups, these being obtained from the follow-up questionnaire sent in 1987 to the User Groups previously surveyed, as well as to any new groups noted in a list kindly supplied by Bits and Bytes magazine. In this table, groups labelled R are in recess, groups labelled E are specifically educational. Here, too, the response was only about 50% of that in 1984. From these figures, assuming about 100 Computer User Groups with, on average, 50 members each, it could be deduced that about 5,000 people, or 1 in 600 of the population, have been members of such Computer User Groups during 1981-87. But bearing in mind the rapid turnover in membership of such groups, one could easily double this figure, concluding

that 'One in 300 Kiwis is a computer enthusiast'. It is freely admitted, of course, that many of these enthusiasts attend meetings simply to play computer games and exchange software; they should not be regarded as a reservoir of 'amateur computer experts'. It should be noted that it is the 'educational' societies which are growing while others decline in numbers. These 'educational' groups have now merged to form the NZCES (Chapter 3).

Whether for recreation, general knowledge or the need to increase their employability, many New Zealand adults have gone out to seek information about computers. This has enabled New Zealand to adapt to a technological innovation, the microcomputer, so that in a relatively brief period its citizens have become remarkably computer literate. This has been possible only because of a firm commitment to the need for 'lifelong education'. Against today's background of technological, social and economic change, it seems that 'lifelong education' relating to computers will remain popular and become more and more important. This study leads to the conclusion that, whatever new devolved mechanisms are put in place for the restructuring of education in New Zealand, a high priority should be given to the provision of 'lifelong education' for all groups, including the retired, the unemployed and the simply curious. Only in this way can the country as a whole adapt to all-encompassing technological challenges, such as the advent of the computer. This should be firmly borne in mind when educational policy objectives are being set for the future.

FOOTNOTES:

1. Mills, Nancy Watson (1988a)

2. I should like to thank Jeff Aitken for these data and discussion thereof.

Appendix 1

Glossary of Computer Terms Used in the Report

This list is by no means comprehensive, but it defines some of the words used in the text.

APPLICATIONS COURSES: Courses which emphasize the operator as a user of pre-packaged programs such as commercially available wordprocessor, spreadsheet and database programs. Although such 'applications packages' (or 'applications software') come with instruction manuals it is still necessary for first-time users to be taught how to read the manuals and how to use the programs.

BASIC: A system of codewords, or 'language', used in programming, available for most microcomputers. The acronym stands for Beginner's All-Purpose Symbolic Instruction Code.

CAL: Computer-Assisted Learning; it can be divided into two broad groups depending on the degree of initiative given to the learner who uses it. If the learner has a low degree of initiative, as in drill-type programs, touch-type tutors etc., then one often uses the term CAI (Computer Aided Instruction). The other type of CAL is more exploratory in nature.

DATABASE: An accumulation of information which is coded and entered into the computer in such a way that it can be accessed, sorted and listed, as required, by relevant software.

HACKER: Originally applied to describe any compulsive programmer, now used in a narrower sense to describe people who 'get into' other peoples' computer programs, thereby for instance getting access to restricted data.

HARDWARE: A generic term for the computer, disk-drive, screen, printer etc.; the 'machinery' part of the computer, as opposed to the 'software' or programs which are put into the machine.

LANGUAGE: A system of codewords for communicating with computers, e.g. BASIC, LOGO, Pascal, FORTRAN, Machine Code.

LOGO: A 'discovery' language developed by Seymour Papert at MIT, excellent as an introduction to structured programming.

MODEM: A device for linking computers via the telephone lines.

PROGRAMMING COURSES: As opposed to Applications Courses, these teach programming as such, and usually need to be fairly long if the student is to attain any level of expertise.

SOFTWARE: A generic term for computer programs.

SPREADSHEET: A framework within the computer which allows the user to tabulate and sort numerical and financial data, carry out calculations on them, and list the results.

WORDPROCESSOR: An applications program which converts the computer into a typewriter which can be used to edit text and print out the perfected copy.

Appendix 2

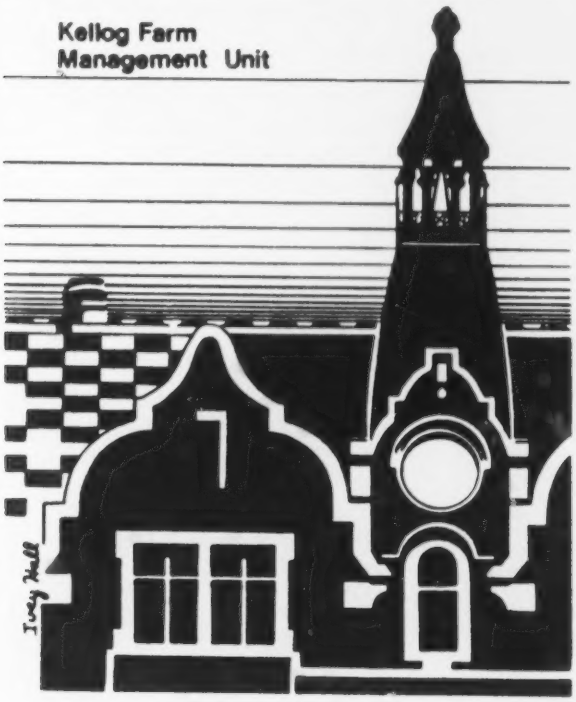
A Selection of Course Curricula and Prospectuses

Computers on the Farm

Rural Development
and Extension Centre
Lincoln College
Canterbury

21-22 Nov 1983
24-25 Nov 1983

Kellog Farm
Management Unit



INTRODUCTION

In this age of micro-computers, farmers are learning that they are no exception when it comes to using them to their own advantage and many studies are being made in the application of the computer as an aid to farm management.

This course will enable farmers to find out for themselves how they can use this new technology.

It is offered by staff of the Kellogg Farm Management Unit at the College. This unit, established in 1980 with a grant from the Kellogg Foundation in the United States, has as its primary job, the development of computer programmes or "software" for use by farmers on farms.

AIM:

A workshop for farmers, and others interested in practical demonstrations and "hands on" experience of micro-computers.

DURATION:

The course will be presented at Lincoln College -

* 21-22 November 1983
* 24-25 November 1983

Prior registration is necessary and will close on 16 November 1983.

The courses are restricted to 20, so early registration is advisable. Limiting the numbers attending each course ensures that everyone will have free access to a computer terminal for "hands on" experience.

Greatest benefit will be obtained if participants live in at the College.

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TARANAKI POLYTECHNIC

Access
TRAINING FOR EMPLOYMENT

RETURNING TO THE WORKFORCE

At the end of the course you will have experience and knowledge to help you make training and job decisions through training in

Computer Skills
Word Processing
Office Skills
Typing
Money Management
Calculators
Interview Techniques
Workshop Experience
Welding
Metalwork
Motor Vehicle Maintenance
First Aid
Effective Communication

COMMUNITY INSTITUTE
WELLINGTON HIGH SCHOOL

Phone: 858-911
858-922

Private Bag
Wellington 1

Kia Ora. Welcome to the Community Institute. This booklet sets out for your information our 1987 Programme of Classes starting Feb 22nd 1988.

The Community Institute — offers the adults of Wellington a large range of community classes.
— facilitates life-long learning as a response to a changing social and economic situation.
— makes maximum use of the facilities and resources of Wellington High School.
— is funded by the Department of Education.

I hope that this information will be a help to you in assessing your learning needs and the options available to you. Remember: Learning is for Life.

Dr Michael Cash,
Director, Community Institute.

COMPUTER CLASSES FOR 1988

	TIME	MONDAY		TUESDAY	WEDNESDAY		THURSDAY
TERM 1	5.30pm	C1 - CF 22 Feb	C8 - AW 28 March	C5 - SFC1 23 Feb	C10 - B1 24 Feb		B35 - Comp Key 25 Feb
	7.30pm	C2 - CF 22 Feb	C17 - P1 28 March	C6 - SFC 23 Feb	B31 - WP2 24 Feb		B28 - WP1 25 Feb
TERM 2	5.30pm	C15 - L1 23 May	C16 - L2 18 July	C5 - SFC (Cont)	C13 - AL1 25 May		B36 - Comp Key 26 May
	7.30pm	C19 - P2 23 May		C6 - SFC (Cont)	B32 - WP2 25 May		B29 - WP1 26 May
TERM 3	5.30pm	C22 - PT1 12 Sept		C5 - SFC (Cont)	C3 - CF 14 Sept	C7 - AW 19 Oct	B33 - WP 2 15 Sept
	7.30pm	C21 - PT3 12 Sept		C6 - SFC (Cont)	B34 - WP3 14 Sept		B30 - WP1 15 Sept

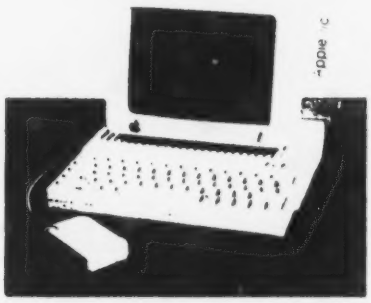
CODE:

CF	= Computer Familiarization	L1	= LOGO Introductory
AW	= AppleWorks	L2	= LOGO Intermediate
WP1	= Word Processing Introductory	P1	= Pascal Introductory
WP2	= Word Processing Intermediate	P2	= Pascal Intermediate
WP3	= Word Processing Advanced	P3	= Pascal Advanced
B1	= Introduction to BASIC	PT1	= Programming Techniques
AL1	= Apple // Assembly Language	SFC1	= Sixth Form Certificate

apple® - ymca

computer learning courses

WE HAVE THE COMPUTERS



12 APPLE 11c's with built-in Disc drives and VIDEO Display Units.

WE HAVE THE COURSES

Short learning courses for —

Working people
Retired people
Men and Women at home
Students and Young people
Business People
Orchardists

COURSES from only $20
AUGUST 16 · SEPTEMBER 13

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YMCA COMMUNITY SERVICES

Information on courses and enrolment form inside . . .

CARRINGTON
Technical Institute

SUMMER SCHOOL SEMINARS

COMPUTERS

A series of one-day Seminars from 9.00 am to 4.30 pm on fundamental information about computers, conducted in an educational environment by a panel of tutors. Ample opportunity for hands-on participation. The fee of $65 includes course notes, luncheon and a social hour.

COURSE NO.

761 **COMPUTERS IN THE HOME**

Friday, 23 November 1984

The home computer has many uses for the family - education, home accounts, games and the technological future.

762 **COMPUTERS FOR THE SMALL BUSINESS**

Friday, 30 November 1984

How to choose and use a computer within your business.

763 **COMPUTERS FOR HORTICULTURE**

Friday, 7 December 1984

Computer based information for control and management.

764 **COMPUTER ENVIRONMENTAL CONTROL**

Friday, 14 December 1984

Microcomputers used for security and automated monitoring systems.

ENROLMENT PROCEDURE

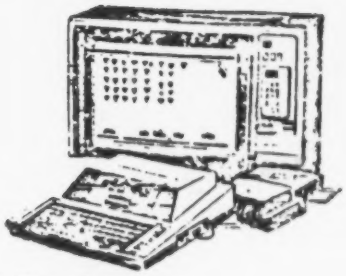
Pre-enrolment is essential for these seminars and no telephone bookings will be accepted.

As no enrolments will be confirmed by phone, you should assume you have been accepted into the course. The only communication you would receive from the Institute is to advise of the over-subscription or cancellation of a course. Receipts will be available at each Seminar.

Early enrolments are necessary, as class sizes are limited.

FAIRFIELD COLLEGE TRUST

COMPUTER CLASSES



This is your chance to keep up with the rapidly changing technology of the 1980s. The Trust is aware that there is an increasing demand by the community for computer related courses. Below is a list of possible courses.

- WORD PROCESSING
- LOGO FOR KIDS — SIMPLE PROGRAMMING IN 5 MINUTES, 8-14 YEARS
- COMPUTER AWARENESS (IDEAL FOR BEGINNERS)
- BASIC PROGRAMMING — BEGINNERS, INTERMEDIATE, ADVANCED
- PASCAL — FOR MORE ADVANCED
- PARENTS "CATCH-UP" COURSE
- FRIDAY CLUB-NIGHT 7.00-9.30 APPLE USERS
- PRIMARY TEACHERS — PROGRAMMING IN LOGO
- SMALL BUSINESS — VISCAL AND P.F.S. (APPLE)
- MICRO-COMPUTERS AND THE PROFESSIONS

If enough people are interested, courses will be organised at the most popular times.

$2.50 per hour for children
$4.00 per hour for adults

THIS ROUND OF COURSES STARTS 20 FEB (5 weeks)

SECOND ROUND STARTS MARCH 26

Mon.:	**5.30-7.30 Basic Programming**	**Wed.:**	**5.30-7.30 Basic Programming**
	7.30-9.30 Business & Professional		**7.30-9.30 Pascal Programming**
Tues.:	**4-6 Children's Logo**		
	7-9 Computer Awareness	**Thurs.:**	**4-6 Children's Logo**
Fri.:	**7-9 Club Night**		**7-9 Word Processing**

All Welcome

University of Waikato
PRIVATE BAG HAMILTON NEW ZEALAND TELEPHONE 62 889
Centre for Continuing Education

COURSE/SEMINAR NAME	LOCATION	ENROLMENT NO.
1981		
People and Computers	Edgecumbe	16
People and Computers	Gisborne	17
The Computer in Your Pocket	Hamilton - course	29
Programming in Pascal	Hamilton - course	31
Programming in Pascal	Hamilton - course	29
Introduction to Computers for Teachers	Hamilton - seminar	44
1982		
Microcomputing for Farmers	E.B.O.P.	11
Microcomputing for Farmers	Gisborne	21
Catch up with Computers	King Country	42
Microcomputing for Farmers	King Country	23
An Introduction to Computers	Waikato	41
Catch up with Computers	Waikato	41
Catch up with Computers	Tokoroa	41
Catch up with Computers	Hamilton - course	48
Catch up with Computers	Hamilton - course	49
Microcomputing for Farmers	Hamilton - seminar	19
1983		
Microcomputing for Farmers	Rotorua - cancelled	
Teachers and the New Technoolgy	Rotorua	32
Microcomputing for Farmers	Gisborne	13
Microcomputing for Farmers	King Country	18
New Technology and People	Tokoroa	21
Catch up with Computers	Hamilton - course	58
Basic Computers Programming Workshop	Hamilton - course	23
Catch up with Computers	Hamilton - course	47
Microcomputing for Farmers	Hamilton - seminar	16
New Technology: Its Future Impact	Hamilton - seminar	209
1984		
Catch up with Computers	Thames Valley	35
Home Computers - Pause Before You Buy	Hamilton - course	33
New Technogloy - 2nd Industrial Revolution	Hamilton - course	42
Home Computers - Pause Before You Buy	Hamilton - course	28
1985		
Catch up with Computers	Hamilton - course	44
Personal Computer in Management	Hamilton - course	9
Social Implications of Computers	Hamilton - seminar	25
Challenge & Future of Information Technology	Hamilton - seminar	26
Computers & Edcuation	Hamilton - seminar	27
1986		
Personal Computers in Management	Hamilton - course	6
1987		
Introduction to Lotus 1-2-3	Hamilton - course	18
Update on Computers	Hamilton - course	13

COMPUTER DAY

" THE COMPUTER DAY "

28 July, 1984

Westland High School

The Computer Day 28 July at Westland High School is going to be g-o-o-d!

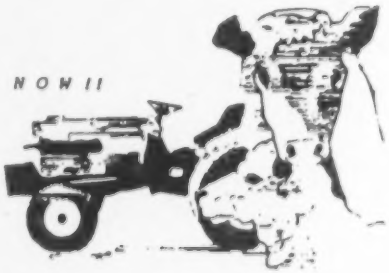
PRIMESOFT, a major supplier of farm business orientated software for computers, confirmed they would supply for demonstration a complete range of all they sell.

This is an opportunity for farmers not to be missed!

WORD PROCESSORS, will also be demonstrated for the home and small business user. This is also a valuable opportunity not to be missed!

COST OF COURSE: $6.00

CONTACT WESTLAND HIGH SCHOOL PHONE 269 N O W !!



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EDGEWATER COMMUNITY EDUCATION

EDGEWATER DRIVE, PAKURANGA

— all enquiries phone —

564-731 OR 569-527

"LEARN SOME MORE IN '84"

ENROLMENT 1984

ENROLMENT FORMS ARE AVAILABLE FROM:

- All local public libraries
- Howick information centre
- Pakuranga CAB
- WEA 21, Princes Street, City
- Edgewater College
- Howick Community Centre
- Uxbridge Leisure Centre

Personal enrolments should be taken to ECEP office every day from 8.30am - 3.30pm, or from 7pm - 9pm on either Tuesday **7 FEB** or Wednesday **8 FEB**. Enrolments can also be made at Pakuranga Town Centre Kiosk on Thursday **2 FEB** or Friday **3 FEB** from 10am -2.30 pm, and Friday 6.30 pm - 7.30 pm, and Saturday **4 FEB** 10 am - noon also at Howick information Centre **2 FEB and 3 FEB** from 10am - 12 noon. Postal enrolments should be sent to ECEP at least one week prior to course starting date.

ALL ENROLMENTS MUST BE ACCOMPANIED BY THE PRESCRIBED FEES.

AFTER ENROLLING ATTEND FIRST SESSION SHOWN UNLESS OTHERWISE NOTIFIED.

LOCATION KEY

EC	Edgewater College		
FC Int	Farm Cove Int. School	PCCC	Pakuranga Community & Cultural Centre
HCC	Howick Community Centre	Uxb	Uxbridge Rd Leisure Centre, Howick
Hwk	Howick Location		
OL	Outside Location	AP	Anchorage Park School

1984 COURSE OUTLINE INCLUDES

- ★ **Day, Weekend and Evening courses**
- ★ **Venue throughout the district**
- ★ **Seminars and Discussion groups**
- ★ **Short and Long courses**
- ★ **Great variety of subjects**

YOUR SUPPORT HAS PROMPTED OUR GROWTH!

72

80

81

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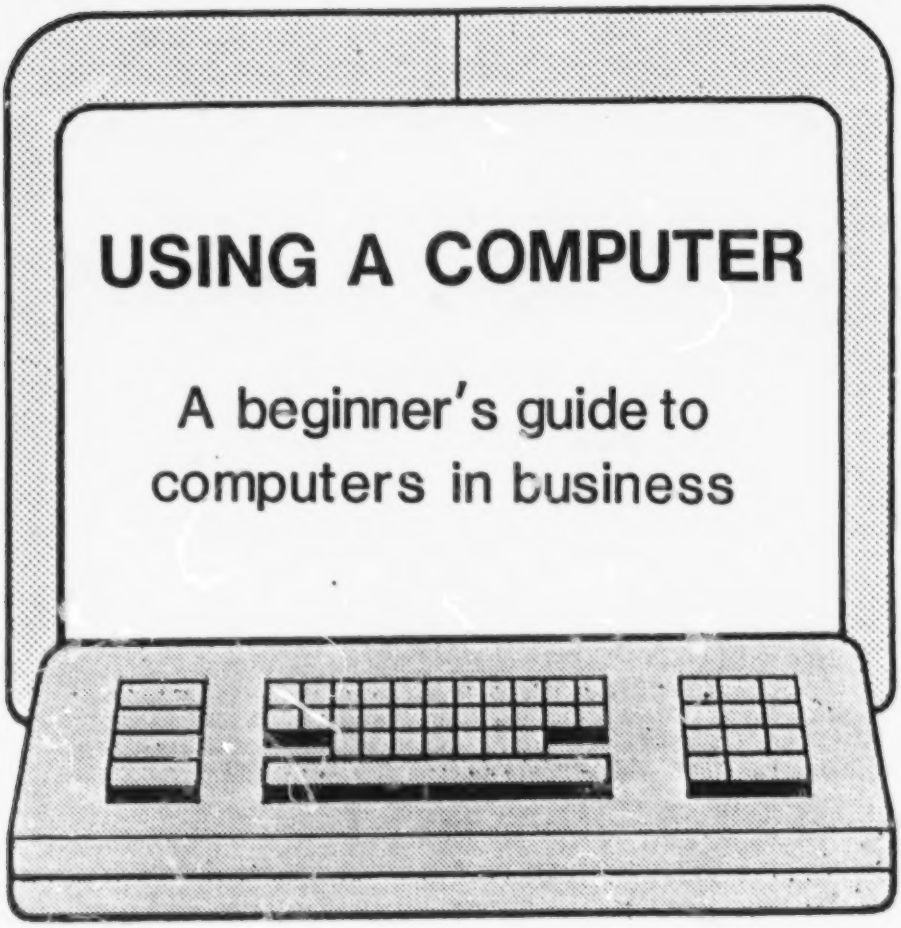

manawatu polytechnic
Cnr. Princess & King Streets, Telephone 67-104, Private Bag, Palmerston North.

82

Canterbury Computer Education Society Inc.

Newsletter

Number 6 July 1987

AUGUST MEETING

CADCAM

Computer aided design: Computer assisted machining.
An evening to find out what it is all about.
A genuine "hands-on" experience.

WEDNESDAY 19TH AUGUST, 1987
7.30 P.M.
K. BLOCK, JOHN HERCUS CENTRE
CHRISTCHURCH POLYTECHNIC

This is an evening to show the use of computers in the real world. Even if it is not relevant to a your specific teaching area, it would serve to make you better informed. CADCAM assists engineers in the design of machinery, architecture, military equipment. The design is displayed on screen, and can be tested to prove its viability.

C. E. D. U.

Computers in Education Development Unit

NEWSLETTER 10

CONTENTS

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2	Word Processors Again
3	Good Educational Software
4	Minimum Standards of Machines
4	Exploratory Studies
7	The Computer Myth
8	A Principals Ten Commandments of Educational Computing
11	Logo Corner
14	Cupid
16	NZCES Conference

Please circulate as per list:

Department of Education 1987

Glenfield College at the beginning of 1982 installed its 'COMPUTER LEARNING' system.

This centre is equipped with 17 Apple Computers and supports the following languages:

Applesoft B.A.S.I.C.

Integer B.A.S.I.C.

U.C.S.D. Pascal

Assembler

LOGO

AIMS OF THE CENTRE

The first priority of the computer centre is to fulfil the present and future needs of the day students and staff of the College.

The second priority is to offer as many computer courses to the community as possible, during the evenings, in the form of:

**** Awareness courses

**** Programming courses

**** Technology courses

**** Business courses

**** Related courses

SPECIFIC COURSES OFFERED

A BEGINNERS COURSE IN PROGRAMMING BASIC

This course of five weeks assumes no previous programming knowledge. The fundamental concepts and instructions are covered, which will ensure that students will be able to write their own simple programmes at the end of the session.
This course is so designed that it leads on to the INTERMEDIATE programming course offered.

AN INTERMEDIATE COURSE IN PROGRAMMING BASIC

This course of five weeks assumes either some previous programming knowledge (in BASIC) or previous attendance on our BEGINNERS' programming course.
Within this course a good logical, planned approach is taken by means of structured diagrams/flow charts. More sophisticated instructions and commands are added to the student's previously acquired list and on completion of the course a good working knowledge of BASIC is assured.

AN ADVANCED COURSE IN PROGRAMMING BASIC

This course of five weeks assumes either a good programming background in BASIC or attendance on our 'INTERMEDIATE' course.
The aim here is to build on previous knowledge and enter the world of mathematics. The usé of internal functions and their manipulation. At the end of this course (for those who wish) an examination of attainment may be sat and a Certificate issued to those who are successful.

INTRODUCTION TO COMPUTERS - AWARENESS

This course of five weeks is specifically for people who have never used a computer before. The aim is to familiarise students with the keyboard and its special keys; to interact with awareness programmes and in so doing demonstrate some applications to which the computer can be put. Simple programming will also be covered at this time to aid students in determining whether they would like to progress to a programming course in the future.

TYPING - KEYBOARD SKILLS

This course of five weeks aims at keyboard familiarisation on a typewriter for future use with a computer. It could also be used as an introduction to Word Processing or Typing.

COMPUTERS IN THE SMALL BUSINESS

This five week course is designed to stimulate the small business person into thinking about such matters as: Does my business really need a computer? What types of computers are there and what is so special about each one? Do I need to be a programmer to use one? These and many more questions will be raised and their implications discussed together with types of programmes available and their uses within the business environment.

Cont'd.....

Appendix 3

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a) Papers and Reports

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b) Books and Background Reading

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Appendix 4

Estimated Numbers of Adult Students and Members of Computer User Groups

Table A1 Estimated numbers of adult students taught in computing courses run by schools between 1981 and 1987

	1981	1982	1983	1984	1985	1986	1987
Ruakaka (Pop. ?)	-	-	-	-	15	30	39
Kaikohe (Pop. 3,790)	-	25	30	28	28	24	14
Tuakau (Pop. 2,230)	-	-	-	20	36	30	16
Dargaville (Pop. 4,880)	-	-	-	-	-	50	20
Waiuku (Pop. 4,440)	-	-	-	24	32	29	107
Kawakawa (Pop. 1,640)	?	?	?	?	40	50	50
Ruawai (Pop. 550)	-	-	-	12	12	12	0
Onehunga (Pop. 15,100)	?	?	?	?	30	30	90
Auckland (Pop. 815,300)							
School A	10	22	45	335	331	353	301
School B	-	-	35	37	37	42	40
School C	?	?	?	60	60	90	80
School D	?	?	?	?	?	70	100
School E	?	?	?	?	?	?	50
School F	0	10	28	36	48	80	152
School G	69	44	235	289	184	123	105
Hamilton (Pop. 102,300)							
School A	?	?	50	50	?	?	12
School B	-	-	-	60	48	72	12
Tokoroa (Pop. 19,400)							
School A	?	56	70	84	98	116	116
School B	-	-	-	-	15	15	0
Mercury Bay (Pop. ?)	-	-	-	-	-	24	20
Tauranga (Pop. 59,000)							
School A	-	-	-	40	50	55	55
School B	-	100	100	100	100	160	140

Te Puke (Pop. 5,070)	30	40	36	45	36	-	-
Whakatane (Pop. 16,100)	-	-	-	-	-	-	50
Edgecumbe (Pop. 2,030)	-	-	28	30	33	30	20
Mt. Maunganui (Pop. 12,450)	?	?	?	?	?	?	54
Morrinsville (Pop. 5,300)	-	-	30	32	30	20	60
Paeroa (Pop. 3,670)	-	-	-	-	18	20	35
Matamata (Pop. 5,480)	-	20	38	64	62	67	59
Rotorua (Pop. 51,100)	-	-	-	-	6	8	6
Turangi (Pop. 4,310)	-	-	-	-	-	-	10
Inglewood (Pop. 3.010)	?	?	?	?	?	2	68
Hawera (Pop. 11,400)	20	20	40	60	60	40	40
Patea (Pop. 1,720)	-	-	-	15	15	15	9
Foxton (Pop. 2,720)	?	?	?	20	40	30	26
Levin (Pop. 18,050)	?	?	?	?	?	?	0
Kapiti (Pop. 5,900)	-	60	60	60	60	60	60
Wellington (Pop. 318,000)							
School A	?	?	?	?	?	?	?
School B	-	-	55	55	75	75	200
School C	-	-	-	-	60	80	120
School D	-	-	-	40	60	35	62
Masterton (Pop. 18,450)							
School A	-	-	-	-	7	6	8
School B	-	-	20	20	40	70	100
Dannevirke (Pop. 5,780)	-	-	30	30	40	50	70
Hastings (Pop. 54,700)	?	?	?	?	60	60	60
Napier (Pop. 52,700)							
School A	-	-	-	-	-	20	60
School B	-	-	-	-	30	30	30
Golden Bay (Pop. ?)	15	15	15	15	32	21	17
Nelson (Pop. 44,000)	-	-	20	37	38	60	40
Blenheim (Pop. 18,500)	-	-	-	32	35	35	37

Westport (Pop. 4,570)	?	?	?	?	?	?	64
Hokitika (Pop. 3,300)	15	15	15	15	15	15	50
Christchurch (Pop. 289,100)							
School A	?	?	?	?	?	36	27
School B	?	?	?	?	?	?	0
School C	-	-	-	30	30	30	40
School D	30	30	40	60	40	40	18
Methven (Pop. ?)	-	-	-	-	19	-	2
Cheviot (Pop. ?)	-	-	-	-	-	-	11
Rangiora (Pop. 6,640)	?	?	?	?	60	60	65
Ashburton (Pop. 14,150)	60	44	78	89	65	103	55
Geraldine (Pop. 2,150)	?	?	?	?	10	12	24
Kaiapoi (Pop. 5,030)	?	30	30	30	20	30	30
Leeston (Pop. 990)	15	15	15	15	20	60	30
Oamaru (Pop. 14,550)							
School A	-	-	-	-	3	-	-
School B	-	-	-	-	-	-	-
Owaka (Pop. 440)	-	-	-	-	10	12	15
Twizel (Pop. ?)	-	-	22	45	38	17	14
Alexandra (Pop. 4,580)	-	-	-	35	45	40	40
Mosgiel (Pop. 9,270)	-	-	-	-	-	40	40
Tuatapere (Pop. 910)	-	-	-	12	-	24	30
Riverton (Pop. 1,440)	-	-	-	20	-	-	-
TOTALS	264	546	1,165	2,081	2,376	2,808	3,375
GRAND TOTAL OVER SEVEN YEARS							12,615

KEY: - No courses indicated
? No information available

NOTE: The above list is in roughly geographical order, north to south, and gives the number of adult students taught in computing courses in schools by geographical region (town, district, or greater urban area in the case of Auckland and Wellington). The estimated population figures of the region were obtained from the Department of Statistics, and relate to March 1984. The information in the body of the table was obtained from the follow-up to the first questionnaire (See Chapters 2 and 7).

Table A2 Estimated numbers of members in Computer User Groups: 1981-87

Reference No.	1981	1982	1983	1984	1985	1986	1987
A1	-	-	-	15	60	65	76
A2	-	-	9	26	42	63	94
A3	-	-	-	-	25	60	40
A4	45	50	60	65	50	30	?
A5	-	-	-	?	?	?	25
A6	-	-	50	50	50	45	40
A7	-	-	-	-	30	40	50
A8	-	-	-	?	?	?	25
A9	-	40	100	120	140	50	20
A10	-	-	-	-	28	64	22
A11	-	-	-	-	52	38	34
A12	-	-	-	-	-	130	400
A13	60	80	90	90	80	70	80
A14	-	-	8	16	13	7	3
A15	?	?	?	?	?	?	?
A16	50	80	100	150	150	100	50
A17	?	?	80	110	180	207	157
Total	155	250	497	642	900	969	1,116
Average Membership	52	62	62	71	69	69	74
R1	-	8	10	0	0	0	0
R2	-	-	100+	70	40	30	-
R3	-	-	-	80	200	200	-
R4	-	-	-	-	30	60	-
R5	-	?	?	amalgamated with another group			
Total	-	8	110	150	270	290	-
Average Membership	-	8	55	75	90	97	-
E1	-	-	-	30	40	50	50
E2	-	40	50	60	90	90	90
E3	-	-	10	15	15	22	23
Total	-	40	60	105	145	162	163
Average Membership	-	40	30	35	48	54	54
OVERALL TOTAL	155	298	667	897	1,315	1,421	1,279
AVERAGE MEMBERSHIP	52	50	56+	64	69	71	71

KEY: - No members
? Membership not known

NOTE: The information in this table was obtained from a follow-up questionnaire sent to Computer User Groups in 1987 (Chapter 3). The reference numbers in the left column signify the character of the group, those coded A remaining active, those coded R having gone into recess, and those coded E referring to groups which are specifically educational in aim, namely, the

Computers in Education (CES) groups. The latter have now amalgamated to form the NZCES, which has held two national conferences. They are continuing to grow, while the other groups have, on the whole, diminished in numbers or gone into recess. Many questionnaires were marked 'return to sender', indicating the transient nature of these groups over the three-year period of the research.